

Dissertation press release

14.05.2020

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

Title of the dissertation	Surface-impedance engineering for advanced wave transformations
Contents of the dissertation	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.
Field of the dissertation	Radio Engineering
Doctoral candidate	Xuchen Wang, M. Sc. (Tech.) Born in Ningbo, China, 1988
Time of the defence	29.05.2020 time 18:00
Place of the defence	The public defence will be held via remote connections. Link to the Zoom event: https://aalto.zoom.us/j/xxxxxxx .
Opponent	Prof. Juan Sebastián Gómez-Díaz, University of California, Davis, USA
Custos	Prof. Sergei Tretyakov, Aalto University, School of Electrical Engineering, Department of Electronics and Nanoengineering
Electronic dissertation	http://urn.fi/URN:ISBN:978-952-60-3879-7 (<i>permanent link to dissertation, if dissertation is already available in electronic form</i>) (e.g. https://aaltodoc.aalto.fi/handle/123456789/53)
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