

# METAMATERIALS

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Metamaterials are man-made structures possessing predefined electromagnetic properties. These artificial, engineered media have been under development for about 15 years now. They are composed of sub-wavelength features (meta-atoms), which through their interaction with light lead to unusual optical properties, such as a negative (effective) refractive index. Metamaterials having simultaneously negative electric permittivity and magnetic permeability, which leads to a negative refractive index, have been experimentally constructed, tested and found to be in agreement with theory in frequency regions from the radio all the way to the optical regime. Here, we review the basic premises of these media and the routes that are usually followed towards constructing them. In particular, we explain in some detail how one can create a medium possessing negative permittivity and/or negative permeability. Further, we discuss in some detail applications of those materials and current trends in their fabrications using chemical methods.

**TUESDAY, FEBRUARY 10, 2015**

**4:00 PM | N1046 - SCIENCE BUILDING**

Wilfrid Laurier University, 75 University Ave. W., Waterloo

Physics & Computer Science Seminar  
Series Co-ordinators: Ilias Kotsireas,  
Paul McGrath and Marek Wartak

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