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Biomimetics and optical cloaking

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Cloaking of macroscopic objects of any specific design is of paramount interest and still remains a challenge, despite of successful demonstration of certain test objects, especially using optical frequencies. This presentation illustrates a relatively new concept of using plasmonics for optical cloaking, especially used for critical assets. Metamaterials have demonstrated flexibility in manipulating electromagnetic waves and producing new functionalities, including the invisibility cloaking based on coordinate transformation. The concept suffers from major limitation, nevertheless has demonstrated a potential use for future applications. The presentation outlines the principles of design of metamaterial implementation for cloaking at the optical frequencies. Optical invisibility is one of the many tools in an ecosystem of innovations to enhance peace and security globally. An outline of some additional tools employing nanomaterials considered in support of smart defense doctrine will be outlined.

Biography

Ashok K Vaseashta received a PhD from the Virginia Tech, VA in 1990. Currently, he serves as Director of Research at the CISTeck/ICWI with NUARI. Concurrently, he serves as visiting Professor in Romania and Chaired Professor at the Academy of Sciences of Moldova. He also served as a visiting scientist at the Weizmann Institute of Science, Israel. Since 2007, he had several fellowships at the U.S Department of State serving in the offices of WMDT and Foreign Consequence Management and as S&T advisor in the office of Verification and Transparency Technologies. He is Fellow of the American Physical Society, Institute of Nanotechnology, and New York Academy of Sciences. He was awarded Gold medal by the University of Armenia for his contribution to Nanotechnology. He has earned several other fellowships/awards for his meritorious services. His research interests include counter-terrorism; chemical-bio sensors; water safety and security; environmental pollution monitoring and remediation; and green nanotechnology. He authored over 230 research publications and edited/authored six books. He is an active member of several national and international professional organizations.

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