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Press release **Defence on 3 December 2021**

Nanocomposite with Polarizonic Reflective Coloration: from Fabrication to Function

Title of the doctoral thesis	Nanocomposite with Polarizonic Reflective Coloration: from Fabrication to Function
Content of the doctoral thesis	Plasmonic nanoparticles/nanocomposites are famous for their attractive colors owing to their unique properties such as absorption and scattering. However, such structures can bring about some interesting characteristics, e.g., polarizonic coloration as has been recently reported. Such a coloration is created based on the specular reflection of these nanostructures. The dissertation focused on showing the great potential of such polarizonic structural coloration for a diverse range of applications including solar energy harvesting (e.g., perfect colored absorber) and bio-sensing. In this thesis, solar aluminum kitchen foils with vivid colors based on metallic nanocomposites which can be utilized in energy and packaging and decoration purposes as well as solar black absorber materials based on oxide particles were obtained. Moreover, the findings of this dissertation in bio-detection area introduced the visual and bulk detection of biological samples (e.g., human serum exosomes). Finally, the introduced results based on such coloration mode offer a new way for solving challenges and limitations of plasmonic (absorption mode) concerning the energy harvesting and bulk bio-detection areas.
Field of the doctoral thesis	Materials Science
Doctoral candidate and contact information	M.Sc. Moheb Abdelaziz Mohep_999@yahoo.com & moheb.abdelaziz@aalto.fi
Defence date and time	3 December 2021 at 13 o'clock
Remote defence	https://aalto.zoom.us/meeting/68760249450
Place of defence	Aalto University School of Chemical Engineering, Lecture hall Ke5, Kemistintie 1, (main door at Biologinkuja) Espoo
Opponent(s)	Professor Walter Remo Caseri, ETH Zurich, Switzerland
Custos	Professor Mady Elbahri, Aalto University School of Chemical Engineering
Link to electronic thesis	https://aaltodoc.aalto.fi/handle/123456789/51
Keywords	Polarizonic, Plasmonic, Nanoparticles, Nanocomposite, bio-sensing, colored perfect absorber

Dissertation will be on public display at https://aaltodoc.aalto.fi/doc_public/eonly/riiputus/