

## **In search of novel promising materials for plasmonics, nanophotonics and biomedicine: new opportunities and development outlook**

In this report we would give some short introduction to the current state of the art of plasmonics with emphasis to well-developing directions related to both collective optical response of 2D structures of dielectric and plasmonic nanoparticles [1, 2], to alternative plasmonic materials [1-4], as well as to some other our recent achievements in this field[1-5]. Then we will show some applications in Telecom, Biomed and the others.

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[2] V.S. Gerasimov et al, Engineering Mode Hybridization in Regular Arrays of Plasmonic Nanoparticles Embedded in 1D Photonic Crystal, Journal of Quantitative Spectroscopy and Radiative Transfer (2019), <https://doi.org/10.1016/j.jqsrt.2018.11.028>

[3] A.D. Utyushev et al. Engineering novel tunable optical high-Q nanoparticle array filters for a wide range of wavelengths, Optics Express 28(2):1426-1438. (2020) DOI: [10.1364/OE.28.001426](https://doi.org/10.1364/OE.28.001426)

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[5] A.S. Fedorov et al, Charge-transfer plasmons with narrow conductive molecular bridges: A quantum- classical theory, The Journal of Chemical Physics, 151, 244125 (2019) <https://aip.scitation.org/doi/10.1063/1.5131734>

[6] L.K. Sørensen et al, Plasmonic nano-shells: Atomistic discrete interaction versus classic electrodynamics models, Physical Chemistry Chemical Physics, 22, 13467-(2020) <https://pubs.rsc.org/en/content/articlelanding/2020/CP/D0CP02248A#!divAbstract>