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Nanoscale manipulation of light using topological plasmonic crystals CHENXU LIU, M. V. GURUDEV DUTT, DAVID PEKKER, University of Pittsburgh — Robust manipulation of light at the nanoscale is an outstanding problem in photonics and quantum optics. Here we propose a topologically inspired solution to this problem. We analyzed a plasmonic crystal composed of an array of parallel nanowires with unequal spacing. In the paraxial approximation, the Helmholtz equation that describes the propagation of light along the nanowires maps onto the Schrdinger equation of the Su-Schrieffer-Heeger (SSH) model. We designed a new type of plasmonic crystal structures which can be used to guide, focus and manipulate light using topological defect modes (i.e. domain walls in the plasmonic crystal). The proposed structures could be useful in coupling free-space optics to quantum emitters such as atoms or color centers.

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