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**Bandgap analysis and emission enhancement from Aperiodic Vogel Spiral Arrays of dielectric nanopillars** JACOB TREVINO, Division of Materials Science and Engineering, Boston University, GARY WALSH, LUCA DAL NEGRO, Department of Electrical and Computer Engineering, Boston University — We report on an experimental and theoretical investigation of the structural and photonic mode properties of Vogel spiral arrays of dielectric cylinders in air. We have designed and fabricated hydrogenated amorphous silicon (aSi:H) golden angle spiral nanopillar arrays with localized bandedge modes at the emission wavelength of a commercial near-infrared (NIR) laser dye. Variable-angle reflectance measurements are utilized to experimentally investigate the photon dispersion diagram of spiral arrays and to locate photonic bandgaps. Experimental results are found to be in good agreement with rigorous coupled-wave analysis (RCWA) calculations. These findings offer the opportunity to create novel photonic devices that leverage radially localized and isotropic bandedge modes to enhance light-matter coupling, such as optical sensors, light sources, concentrators, and broadband optical couplers.

Jacob Trevino
Division of Materials Science and Engineering, Boston University

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