

Abstract Submitted
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Scattering on hyperbolic microspheres: From photonic nanojets to Poisson-Arago bright spots REED HODGES, CLEON DEAN, MAXIM DURACH, Georgia Southern University — We investigate optical properties of metal-dielectric metamaterial microspheres composed of subwavelength spherical shells of two different materials alternating in an onion-layer fashion. Recently such metamaterial spheres were considered as cavities and their whispering gallery modes were investigated. We focus on the scattering of external radiation by the metamicrospheres in this work. We show that different scenarios are produced by altering the metal fraction in the spheres: as the microsphere transitions from all-dielectric to hyperbolic to all-metal, the photonic nanojets transform into Poisson-Arago bright spots. A new phenomenon also emerges as the percentage of metal in the microsphere increases. “Hot spots” of optical fields intensity appear at the center of the sphere. Their intensity is much higher than that of the incident plane wave.

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