

Abstract Submitted  
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**Trap rainbow in a self-similar coaxial optical waveguide**<sup>1</sup> RU-WEN PENG, QING HU, FENG GAO, RUI-LI ZHANG, MU WANG, National Laboratory of Solid State Microstructures — We report in this work that the light waves with different frequencies can be selectively guided and spatially separated in a self-similar dielectric waveguide, where a hollow core is surrounded by a coaxial Thue-Morse multilayer. Due to the self-similar furcation feature in the photonic band structure, the transmission multibands are achieved. More interestingly, this dielectric waveguide supports cladding modes, which are spatially separated and confined along the waveguide. Consequently, a rainbow can be trapped (spatially confined but not stopped) in the Thue-Morse waveguide. The finding can be applied to designing miniaturized compact photonic devices, such as spectroscopy on a chip. Reference: Qing Hu, Jin-Zhu Zhao, Ru-Wen Peng, Feng Gao, Rui-Li Zhang, and Mu Wang, *Appl. Phys. Lett.* (2010) 96, 161101.

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