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Random Lasing in Multidomain Cholesteric Liquid Crystals MICHELE MOREIRA, MINGXIA GU, OLEG LAVRENTOVICH, BAHMAN TAHERI, PETER PALFFY-MUHORAY, Liquid Crystal Institute, KSU — A conventional laser consists of a pumped amplifying medium and an optical cavity to provide feedback for light amplification. In disordered materials, light can be trapped by multiple scattering processes and, if a gain medium is added, random lasing can occur. This random laser source does not require a regular cavity, but instead depends on multiple scattering in a random medium. Random lasers have attracted considerable attention recently because of their low cost and ease of construction. We present recent results of our random lasing experiments in dye-doped multidomain cholesteric liquid crystals, with submicron pitch, where the highly reflective cholesteric domains are the scattering elements. We discuss the underlying physics, compare the performance of these systems with others, consider the effects of temperature on the emission spectrum, and suggest possible applications.

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