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Chiral hierarchal self-assembly in Langmuir monolayers of diacetylenic lipids[1] ELIZABETH MANN, PRITAM MANDAL, PREM BASNET[2], DOMINIC MALCOLLM[3], Deptartment of Physics, Kent State University, SAHRAOUI CHAIEB, Physical Science and Engineering, KAUST, Thuwal, KSA —
A Langmuir monolayer made of chiral lipid molecules forms a hierarchal structure when compressed in the intermediate temperature range below the chain melting temperature. These structures are captured via Brewster angle microscopy. When the liquid monolayer is compressed, an optically anisotropic condensed phase nucleates in the form of long, thin claws. These claws pack closely to form stripes. This appears to be a new mechanism for forming stripes within Langmuir monolayers. In the lower temperature range these stripes arrange into spirals within overall circular domains, while near the chain melting transition the stripes arrange into target-structure. We attributed this transition to a change in boundary conditions at the core of the largest-scale circular domains.

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