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Smectic Defects with Riemann Reason ELISABETTA MATSUMOTO, RANDALL KAMIEN, CHRISTIAN SANTANGELO, University of Pennsylvania — Minimal surfaces are natural starting points when considering smectics because they minimize the bending energy of the layers. Alternatively, "sums" of screw dislocations have been used to model twist-grain boundaries, and often lead to layers with the same topology as classic minimal surfaces. We use Riemann's minimal surface as a model for a smectic whose layers are joined by pores. We evaluate the energetics of this surface using an explicit phase field representation in terms of elliptic functions. We also build a surface with the same topological structure as Riemann's minimal surface using a configuration of oppositely-charged screw dislocations.

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