

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**The Power of Poincaré: Elucidating the Hidden Symmetries in Focal Conic Domains** ELISABETTA A. MATSUMOTO, GARETH P. ALEXANDER, BRYAN GIN-GE CHEN, RANDALL D. KAMIEN, Department of Physics and Astronomy, University of Pennsylvania — Focal conic domains are typically the “smoking gun” by which smectic liquid crystalline phases are identified. The geometry of the equally spaced smectic layers is highly generic but, at the same time, difficult to work with. We develop an approach to the study of focal sets in smectics which exploits a hidden Poincaré symmetry revealed only by viewing the smectic layers as projections from one-higher dimension. We use this perspective to shed light upon the concentric cyclides of Dupin and several classic focal conic textures which exhibit a more widespread level of geometric organization as in Friedel’s law of corresponding cones, the networks and trellises expounded by Bouligand, or Apollonian packings.

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Date submitted: 07 Dec 2010

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