



Announcing

A Seminar Presentation
on Thursday

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at 2:00 pm - 3:00 pm in

MAXCY 124

at The University of New Haven

Self-assembly in chromonic liquid crystals

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Abstract: Liquid crystals are a distinct phase of matter existing between the chaos of isotropic liquids and the order of crystalline solids. In addition to being partially ordered, they manifest sensitivity to changes in temperature, concentration, or electric and magnetic fields. These properties render liquid crystals useful in various optical and biological applications. Chromonic liquid crystals, which can be used to model confined DNA, are composed of disc-like molecules that tend to stack on top of each other when dispersed in water. When a threshold concentration is reached, the columns formed bend into rings, and these in turn aggregate into interesting geometrical shapes. An important question in this setup is how the dominant mechanism - shape formation in this case - is affected by specific system parameters. We formulate the model as an energy minimization problem with several constraints. Our results address torus shape formation, and how it is affected by interfacial and elastic material properties as well as concentration. We highlight how simple mathematical tools can be used to deal with such geometrical constraints, and how numerical simulations can help expand the range of parameters deduced from experiments.

Further Information

Refreshments will be provided. Refreshments are served starting at 1:45 pm. For further information, please contact Dr. Phanuel Mariano at the Department of Mathematics and Physics, pmariano@newhaven.edu.