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### **Coexistence, Interfacial Energy and the Fate of Microemulsions of 2D Dipolar Bosons**

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The superfluid-crystal quantum phase transition of a system of purely repulsive dipolar bosons in two dimensions has been the subject of a lot of theoretical study, mainly because of some intriguing predictions by Spivak and Kivelson (2004) regarding an exotic, intermediate "microemulsion" that should appear at low temperature between the crystal and the superfluid. We investigated this scenario by means of Quantum Monte Carlo simulations at zero temperature, determined freezing and melting densities, and estimated the energy per unit length of a macroscopic interface separating the coexisting crystal and superfluid phases. The results rule out quantitatively the microemulsion scenario for any physical realization of this system, given the exceedingly large predicted size of the bubbles. Reference: S. Moroni and M. Boninsegni, Phys. Rev. Lett. **113**, 240407 (2014)