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Yanxiang Zhao and **Xiaofeng Ren**. *Pattern formation - on the modeling of multi-constituent inhibitory systems.*

Skin pigmentation, animal coats and block copolymers can be considered as multi-constituent inhibitory systems and studied as a nonlocal geometric variational problem. The free energy of the system is the sum of two terms: the local part - the total size of the interfaces separating the three components, and the nonlocal part - a longer ranging interaction energy that inhibits micro-domains from unlimited growth. We establish that in different parameter ranges there are corresponding assemblies of certain patterns that exist as the stationary sets of the free energy functional. Numerically, a diffusive interface model is proposed and many self-assembly processes, which form various patterns, are showed here. Different numerical schemes are compared and a new technique is introduced to be consistent with the Euler-Lagrange equation in the sharp interface model. (Received September 25, 2017)