These animations are two examples of reaction diffusion simulations. They are indicative of what happens when we do the Obama globe prior to mapping onto the sphere.

Each one starts with an initial condition that unstable, but the initial condition is biased in such a way that the "system is pushed" towards a particular stable solution. The result that something that is nearly random can be induced to form a structure that is "suggested" but not forced.

The conserved case is the Cahn-Hilliard equation:

$$\frac{\partial \phi}{\partial t} = \nabla \cdot D \nabla \left(\frac{dg}{d\phi} - \kappa_c \nabla^2 \phi \right) \tag{1}$$

with $g(\phi(\vec{x}))$ being a bistable function, such as $g(\phi) = \phi^2(1-\phi)^2$. with initial conditions:

$$\phi(x, t=0) = \frac{1}{2} + \epsilon(\alpha[-1,1] + \text{"image perturbation"}) \tag{2}$$

where $\alpha[-1,1]$ is a uniform random distribution over the interval $(-1,1)$. The boundary conditions are periodic.

The non-conserved cases is Allen-Cahn:

$$\frac{\partial \phi}{\partial t} = M \left(\nabla^2 \eta - \kappa_\eta \frac{dg}{d\phi} \right) \tag{3}$$

with the same initial and boundary conditions.