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Pattern Formation on a Time Dependent Spherical Cap

We try to extend the theory of diffusely-driven patterns on a spherical cap surface by introducing a domain that is slowly dependent on time. The domain evolution preserves the base of the cap, but slowly changes its curvature. The goal of the project is to try to extend the normal form theory for this slow domain evolution using asymptotic expansions on series of eigenfunctions of the Laplace-Beltrami operator, so we can approximately predict how patterns emerge in this case using only non-autonomous ordinary differential equations.

This is work that is currently in progress with Wayne Nagata, so the contents of the talk are currently unknown, but it will probably include a quick overview of the results in the static domain, the extension of the partial differential equation to accommodate for domain evolution, some details on the ODE reduction and possibly some numerical results.