

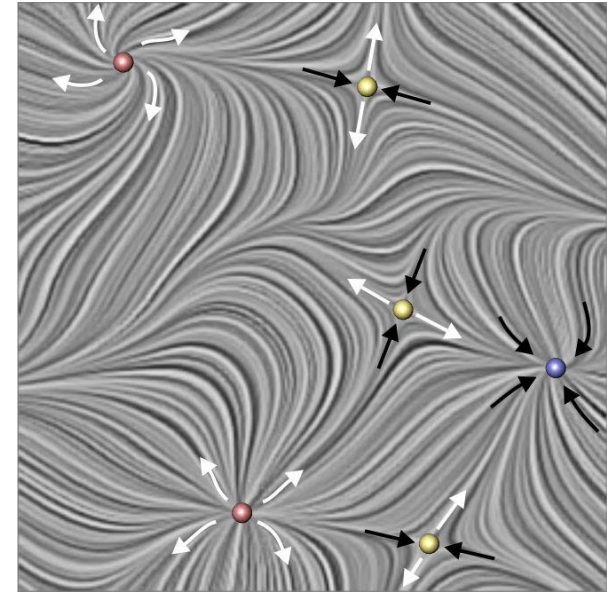
Topological Structures

steady 2D vector field

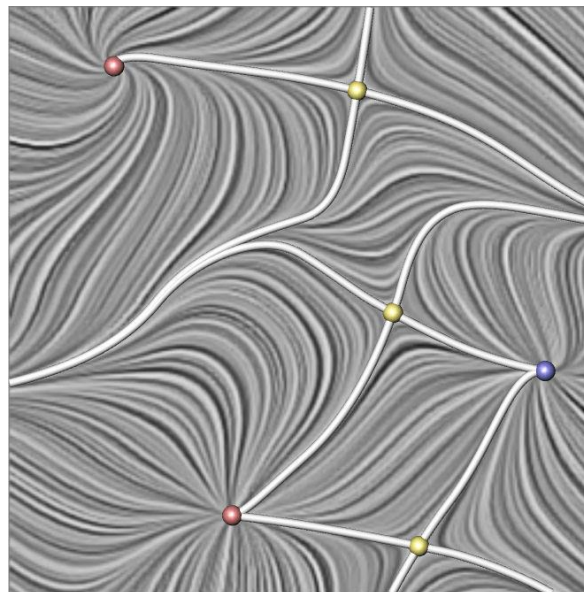
$$\mathbf{v} = \begin{pmatrix} u \\ v \end{pmatrix}$$



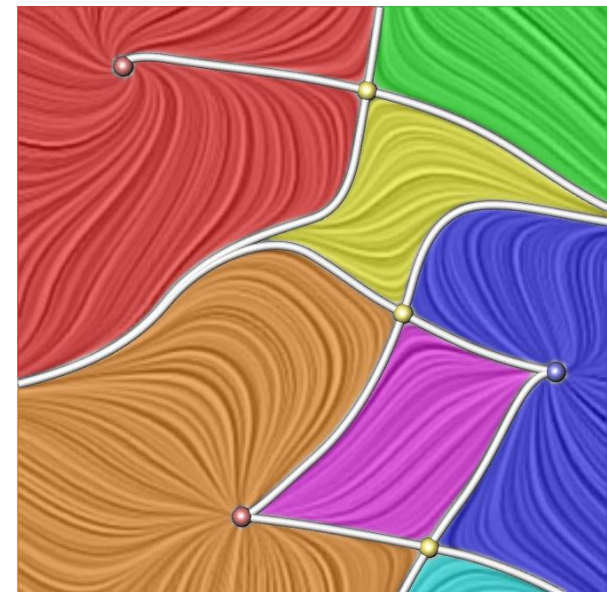
stream lines



critical points



separation lines



sectors of different flow behavior

- **Separatrices:**
 - Special stream lines which separates regions of different flow behavior.

- **Types of separatrices:**
 1. Each stream line originating/ending in a critical point and separating two sectors → is a separatrix.
 2. stream lines through boundary switch points
 3. isolated closed stream lines

- **Separatrices from first order saddle:**
 - 4, in the direction of the two eigenvectors of the Jacobian matrix

