The Topology of Chaos
Chapter 9: Representations of Strange Attractors

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Embeddings

An embedding creates a diffeomorphism between an ('invisible') dynamics in someone's laboratory and a ('visible') attractor in somebody's computer.

Embeddings provide a *representation* of an attractor.

Equivalence is by Isotopy.

Irreducible is by Dimension

Inequivalent Irreducible Representations

Irreducible Representations of 3-dimensional Genus-one
attractors are distinguished by three topological labels:

Parity	P
Global Torsion	N
Knot Type	KT

$$\Gamma^{P,N,KT}(\mathcal{SA})$$

Mechanism (stretch & fold, stretch & roll) is an invariant of
embedding. It is independent of the representation labels.

Equivalent Reducible Representations

Topological indices (P,N,KT) are obstructions to isotopy for embeddings of minimum dimension (irreducible representations).

Are these obstructions removed by injections into higher dimensions (reducible representations)?

Systematically?

Equivalences by Injection

Obstructions to Isotopy

R^3 $\rightarrow$ R^4 $\rightarrow$ R^5

Global Torsion

Global Torsion

Parity

Knot Type

There is one *Universal* reducible representation in R^N, $N \geq 5$.
In R^N the only topological invariant is *mechanism*.