§ Quantum Geometry insights in deep learning Noemie Combe
Boltzmann machine
A connection between optimal transport theory and deep learning。
How [Monge-Ampere equation] governs probability transformations in generative models。

Information geometry：
A statistical manifold is a space where each point represents a probability distribution. For example, the set of all Gaussian distributions forms a statistical manifold parameterized by the mean and variance.

The parameters of the distributions serve as coordinates on this manifold.

2. **Riemannian Metric**:
    - The statistical manifold is equipped with a Riemannian metric, which provides a way to measure distances and angles between probability distributions.
    - The most commonly used metric in information geometry is the **Fisher information metric**, which measures the amount of information that a random variable carries about a parameter.

Frobenius manifold：
Frobenius manifolds were introduced by Boris Dubrov in in the early 1990s as a framework to unify various phenomena in mathematical physics and algebraic geometry。It provides a unifying framework for studying integrable systems，topological field theories，and mirror symmetry， making it a central concept in modern mathematical physics and algebraic geometry。
Quantum geometry：
Deep learning theory：