What is probability?
We define the art of conjecture, or stochastic art, as the art of evaluating as exactly as possible the probabilities of things...

Jacob Bernoulli

1713 The Law of Large Numbers - One of 10-15 main focal Point in Mathematics stated by Gerolamo Cardano in ?1564?).

Wrong Question!
Let us ask instead

What are mathematical principles from which probability theory radiates?
1653 Pascal’s triangle of $C(n,k)$
"Traite du triangle arithmetique avec quelques autres"

1527 The TC(n,k)-triangle was published by Petrus Apianus.

1321 The numbers $C(n,k)$ were computed by Levi Ben Gershon.

1048-1131 Omar Kayam claimed to know $C(n,k)$ for expansion of $(a + b)^n$ and extracting n-th roots.

(1010-1070) In China, Yang Hui in his 1261 paper “Xiangjie Jiuzhang Suanfa” attributes $C(n,k)$ to Jai Xian’s (1010-1070)) paper “Rújī Shìsuǒ”:

- algorithms to extract n-th roots using binomial expansion of $(a + b)^n$

(200 BC) The algorithm to construct the $(a + b)^n$ arithmetic triangle $C(n,k)$ by the recursion

$C(n,k) = C(n-1,k-1) + C(n-1,k)$:
Commentary to "Mrtasa njivani" written by Halayudha, in 10th century AD:

linguistic analysis of a sentence in "Chandahśastra" by Acharya Pingala (circa 200 BC).

(In the modern terms Pingala, worked on the coding theory.)

Reference. Localization in geometry and physics by V. Pestun.

1893 Poincaré Duality. Another focal points in mathematics stated by Henri Poincaré in 1893 and expanded in his 1895 paper Analysis Situs.

(PD is an involution between invariants of $k$ and $(n - k)$ dimensional objects in $n$-dimensional spaces, which generalizes the orthogonal complementation to subspaces in the
Hilbert/Euclidean/Pythagorus spaces.)

**Reference.** Manifolds: Where Do We Come From? What Are We? Where Are We Going, M.G.

1982 Kesten’s 1/2 theorem in 2D Percolation (Flory–Stockmayer 1941) Theory. For the square lattice in two dimensions 2 the critical probability for bond percolation is 1/2: the "signature" of the "stochastic fixed point" of the Poincare involution.

(Flory–Stockmayer theory is about the cross-linking and gelation of step-growth polymers.)

Random Linearized Topology, Random Topology Random Spectra, Expanders,
Reference. Singularities, expanders and topology of maps. MG.

Stochastic Linearization of the rules of inheritance

Reference. Mendelian Dynamics and Sturtevant’s Paradigm. MG

Statistical Mechanics and Boltzmann-Shannon Entropy

Linearized Shannon Inequalities, Isoperimetric inequalities and Von Neumann Entropy

Reference In a Search for a Structure, Part 1: On Entropy. MG

Guth Duality between Homology Valued Probabilities of Multi-Particle Systems and the (non-linear) spectrum of the volume functionals.

Reference. Morse Spectra, Homology Measures, Spaces of Cycles
and Parametric Packing Problems. MG

Graph valued Probabilities in Biology and Linguistic.

Stochastic Multi-Particle Representation of non-Linear Geometric PDE motivated by the biophysics of micelles.