

Synopsis:
As our earlier Compendium makes clear, mathematicians have been fascinated by the decimal expansion (and expansions in other bases) of $\pi$ since the time of Archimedes — what sort of number is $\pi$? Questions such as whether $\pi$ is rational or not, or algebraic or not, were settled in the 18th and 19th century, respectively.

But one question, originally raised by Borel in 1909, remains unanswered even today: whether or not $\pi$ is normal. A real constant is said to be normal base $10$, or 10-normal, if every $m$-long string of digits appears in the decimal expansion of $\pi$ with limiting frequency $1/10^m$ (with a similar definition for a general base $b$), and is said to be absolutely normal if it is $b$-normal for all integer bases $b$ simultaneously.

In this highly readable paper, Wagon introduces the question of the normality of $\pi$ in the context of the recently discovered quadratically convergent algorithms. He also presents a statistical analysis of the digits of $\pi$ provided by Yasamusa Kanada, who had, at the time, just computed $\pi$ to 10,000,000-digit precision.

Keywords: Computation, General Audience, Normality