

Weird Circle Fixation

“Why do mathematicians care so much about pi? Is it some kind of weird circle fixation?”

Hardly. The beauty of pi, in part, is that it puts infinity within reach. Even young children get this. The digits of pi never end and never show a pattern. They go on forever, seemingly at random — except that they can’t possibly be random, because they embody the order inherent in a perfect circle. This tension between order and randomness is one of the most tantalizing aspects of pi.

Pi touches infinity in other ways. For example, there are astonishing formulas in which an endless procession of smaller and smaller numbers adds up to pi. One of the earliest such infinite series to be discovered says that pi equals four times the sum $1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \dots$. The appearance of this formula alone is cause for celebration. It connects all odd numbers to pi, thereby also linking number theory to circles and geometry. In this way, pi joins two seemingly separate mathematical universes, like a cosmic wormhole.”

— Steven Strogatz, “Why Pi Matters,” The New Yorker, March 13, 2015

“Since it seems obvious to us that time runs forward, and that causes precede effects, it is a very curious thing that many of the laws of physics as described by scientists would be equally valid whichever way time ran. In other words, the direction of time, sometimes called the ‘arrow of time’, could be reversed without conflicting the laws of nature. The only scientific principle that seems to show that time must run in the direction in which we all intuitively perceive it to run is the so-called Second Law of Thermodynamics. This is the principle that says, to put it simply, that as time runs forward, hot things get cooler and energy tends to become evenly distributed in the universe. This is true of our Sun, and of a cup of coffee in exactly the same way.

It is not reversible...But there is a loophole even here. The Second Law is not the same kind as most laws of nature. It is a statistical principle that works on probabilities of what billions of atomic and subatomic particles will do...Individual particles are not subject to statistics. On a submicroscopic level, it is quite possible that actual reversals in time do take place, and that individual particles move backwards in time. The cosmologist Thomas Gold has seriously suggested that the present direction of time is a temporary phenomenon and a consequence of the way our universe is currently expanding.”

— Peter Nicholls, The Science in Science Fiction