Introducing The πTOP® or PiTOP®

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Why Pi at G4G13?

(Martin Gardner caricature by Ken Fallin, 2010)

$$e^{\pi\sqrt{163}} \equiv 262{,}537{,}412{,}640{,}768{,}744.0$$

Martin Gardner demonstrated a playful interest in Pi. His April 1975 column in *Scientific American* entitled "Six Sensational Discoveries" reported that in 1974, Ramanajun's 1913 conjecture shown above had been proven to be an exact result!!!

What is the PiTOP®?

It is a physical embodiment of the mathematical constant π. This disk, has a radius of r = 1" and thickness t = 1/π" ~ .32". When made in brass, it weighs ~ 4.8 ounces. It displays the first 109 digits of Pi in a spiral pattern on one side. (The pattern was designed in collaboration with Kaz Brecher.)

What is the point of the PiTOP®?

It is a tactile hand sized stress reliever.

It is an elegant paperweight.

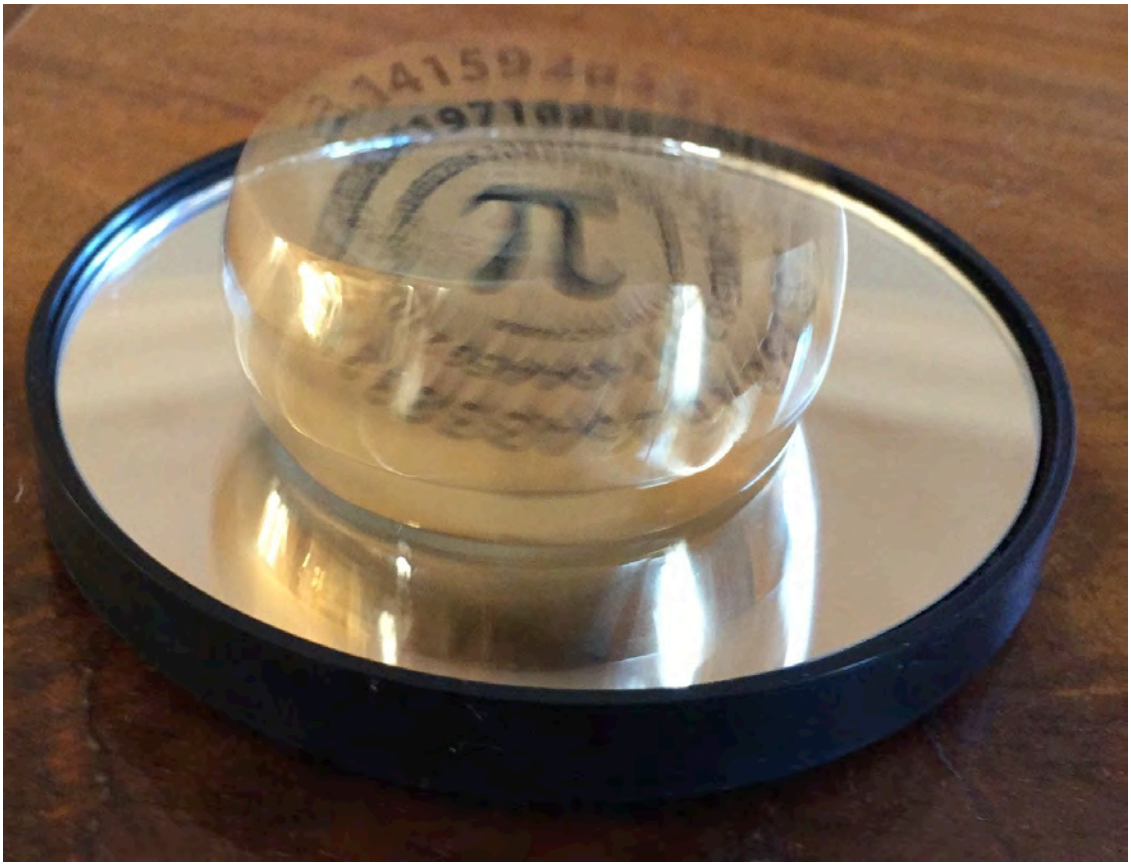
It is a beautiful March 14 Pi Day gift.

It is a personal fidget device.

And it also symbolizes profit in economics!

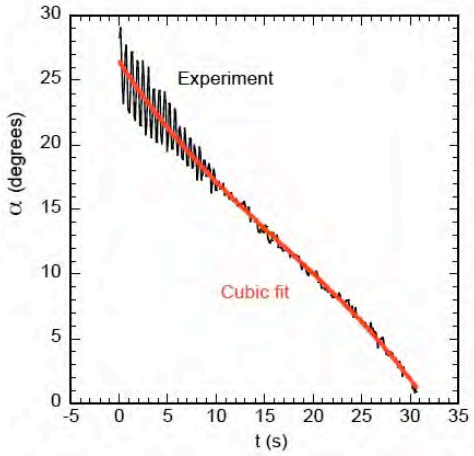
Sound and Light Effects

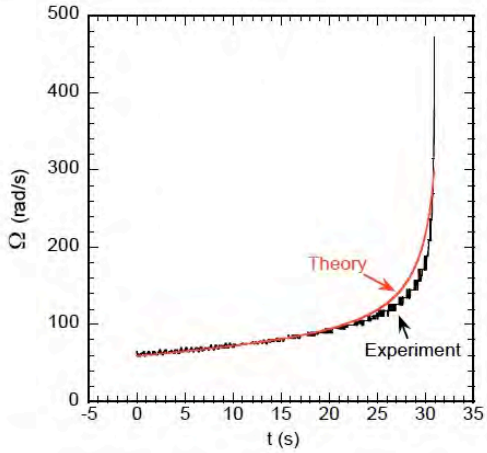
The PiTOP® was designed to optimize its dynamical properties based on a variety of experiments that I carried out with many prototypes. As the PiTOP® spins and precesses, it produces a hypnotic sound and light display.



PiTOP® Dynamics

After spinning it on its edge like a coin, the PiTOP® loses rotational energy due to friction. As the angle α that it makes with the horizontal decreases with time, its precession frequency Ω increases, tending toward a "finite time singularity".





The above data was collected from time-lapse photographic measurements of the spin of a PiTOP prototype that I sent for analysis to Professor Rod Cross at the University of Sydney, (cf. "Effects of Rolling Friction on a Spinning Coin or Disk", *European Journal of Physics*, 39, #3, 5, 2018).

Cubing the PiTOP®

Although one cannot square the circle in a finite number of steps using only a compass and a straightedge, the PiTOP® automatically cubes a right circular cylinder of radius r since it has volume $V_{PiTOP} = \pi r^2 t = \pi r^2 r/\pi = r^3 = V_{cube}$.

The PiTOP® and The PhiTOP®

The PhiTOP was previously introduced at G4G12. They can both be found at:

https://www.etsy.com/shop/SiriusEnigmas