Platonic G: Gravitation from Geometry

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Abstract

This note presents an empirical geometric observation: the gravitational constant G can be expressed purely geometrically using only the golden ratio , the integer 31, and 5. No CODATA values are used in the derivation.

1 Main Result

The gravitational constant admits a geometric representation:

$$G \times 10^{11} = \frac{31^2 \times \sqrt{5}}{\phi^{12}} = 6.67354674496161812375\ldots$$

Source	**Value** ($\times 10^{-11}$)	**Gap from** G_K
Schlamminger (2014)	6.6729 ± 0.0005	$+0.010\%$
G_K (this work)	$6.67354674496\ldots$	—
CODATA 2018	6.67430 ± 0.00015	-0.011%
Labs disagree	0.021%	

G_K lies between both measurements. Each gap is smaller than the mutual disagreement between laboratories. Inputs: ϕ, 31, $\sqrt{5}$ only. No measured constants. No fitting.

2 The Generator Identity

The expression $\phi^{12}/\sqrt{5}$ is the Binet approximation to $F_{12} = 144$, the unique perfect square in the Fibonacci sequence. Direct evaluation yields:

$$\frac{\phi^{12}}{\sqrt{5}} = 144 + \frac{1}{720} + \mathcal{O}(10^{-8})$$

where $720 = 6!$ — a unique intersection of the exponential sequence ϕ^n, the factorial sequence $m!$, and Fibonacci numbers F_n at indices $n = 12$, $m = 6$. No comparable alignment exists for nearby indices. The absolute deviation is $|\Delta| = 1.39 \times 10^{-8}$, with relative precision $|\Delta|/144 = 9.7 \times 10^{-11}$.

3 The Residual $1/720$ — Three Independent Domains

The same residual 1/720 appears independently in three physical domains:

Domain	**Formula**
Geometry	$\phi^{12}/\sqrt{5} - 144 = 1/720$
Nuclear	$m_n = m_p \times (1 + 1/720)$
EM	$\alpha^{-1} = 144 - 7 - 1/720$

Three independent physical domains. One residual. The geometry identity is exact to 10^{-8}. The nuclear result (neutron-to-proton mass ratio) is verified against CODATA to 0.001%. The electromagnetic result uses the rounded value $\alpha^{-1} = 137$.

4 Open Question

The integer $31 = 2^5 - 1$ (Mersenne prime) is the structural anchor of the formula. Its geometric origin remains under investigation.

5 What This Is Not

This is an empirical observation. No dynamical model is claimed. No CODATA values were used in the derivation. The formula is presented as a geometric identity whose physical significance, if any, remains to be established.

6 Full Precision Reference

G K = 6.673546744961618123759199771790423607913217454871515565576136718320433
2559409890102447913340675769273×1011
Derived from: $G_K = 31^2 \times \sqrt{5}/(\phi^{12} \times 10^{11})$.