

Abstract Submitted  
for the CAL11 Meeting of  
The American Physical Society

**A Physical Model for Gravitation and Inertia** NED RASOR, Retired  
— A physical/analytical model of gravitation and inertia is described. The model is based on proportional expansion of the universe and its contents, along with special relativistic time delay within nucleons. An expression of the gravitational constant  $G$  is derived from the model in terms of fundamental constants and properties without adjustable parameters,

$$G = \frac{he^2}{c^2 \tau_u (m_p m_e)^{3/2}} = 6.67 \times 10^{-8} \frac{cm^3}{g \cdot s^2}$$

where  $h$  = Planck constant,  $e$  = electronic charge,  $c$  = speed of light,  $m_p$  and  $m_e$  are the nucleonic and electronic masses, and  $\tau_u$  = age of the universe. The value  $\tau_u = 13.6$  Gy that corresponds with the accepted value of  $G$  shown is within the uncertainty of the empirical value of  $\tau_u$  currently estimated from cosmic ray background and other astronomical data. A modified Newtonian dynamics and other relationships derived from the model are consistent quantitatively and functionally with a variety of observed astronomical data, some of which have been considered previously to be anomalous or based on dark matter.

Ned Rasor  
Retired

Date submitted: 16 Sep 2011

Electronic form version 1.4