Eötvös and the 2013 EUREF Symposium in Budapest

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The universality of free fall

- The gravitational and inertial mass of a body coincide
- Every body falls with the same acceleration regardless of its mass and internal composition
- Embodied in Einstein's General Relativity ('Weak Equivalence Principle') but not by other Relativistic Theories of Gravity (e.g. Brans Dicke's)
- Proved by LLR and other experiments
- The curvature of a trajectory reflects a geometric property of space time rather than an inertial response of a mass to an external field
- Applies to massless particles as well (bending and time delay of photons or light rays in a gravity field – the Shapiro effect)



$$m_I \vec{a} = -G \frac{m_G M}{r^2} \hat{r}$$

mI = mG

The Torsion Balance

- Used to measure the gradient of gravity (cgs unit is the Eötvös =sec-2)
- The gravity gradient is the basis for the knowledge of the gravity field (e.g. ESA satellite CHAMP)
- We need the gravity field to define the equipotentials yielding gravity related heights (EU INSPIRE Directive)



Challenging gravity in the Italian Alps

- Eötvös and his sisters Ilona and Rolanda mountaineering in the Dolomites
- 'Gravity does not pull me down, it drives me forward!'
- Peak named / after Eötvös

