

THE BIRTH OF ISOMATHEMATICS: PHYSICAL AND MATHEMATICAL INSUFFICIENCIES OF NEWTON'S EQUATIONS

Physical insufficiency:

Massive points cannot experience non-potential forces $F_k(t, r, v, \dots)$

$$\mathbf{m}_k \frac{d\mathbf{v}_k}{dt} = \mathbf{F}_k(\mathbf{t}, \mathbf{r}, \mathbf{v}, \dots)$$

Mathematical insufficiency:

Newton's equations are SA while the forces are NSA

$$[\mathbf{m}_k \frac{d\mathbf{v}_k}{dt}]^{\text{SA}} = [\mathbf{F}_k(\mathbf{t}, \mathbf{r}, \mathbf{v}, \dots)]^{\text{NSA}}$$