

KADEISVILI ISOFUNCTIONS (1985)

$$\hat{\mathbf{f}}(\hat{\mathbf{x}}) = \mathbf{f}(\hat{\mathbf{x}}) \times \hat{\mathbf{T}} = \mathbf{f}(\mathbf{x} \times \hat{\mathbf{I}}) \times \hat{\mathbf{I}},$$

$$\hat{\mathbf{e}}^{\mathbf{x}} = \hat{\mathbf{I}} + \mathbf{x}/1! + \mathbf{x} \hat{\times} \mathbf{x}/2! + \dots = [\mathbf{e}^{\hat{\mathbf{x}} \hat{\times} \hat{\mathbf{T}}}] \times \hat{\mathbf{I}} = \hat{\mathbf{I}} \times [\mathbf{e}^{\hat{\mathbf{T}} \hat{\times} \hat{\mathbf{x}}}] .$$

SANTILLI ISOSPACES (1983)

$$\mathbf{S}(\mathbf{x}, \eta, \mathbf{I} \rightarrow \hat{\mathbf{S}}(\hat{\mathbf{x}}, \hat{\eta}, \hat{\mathbf{I}}) : \hat{\mathbf{x}} = \mathbf{x} \times \hat{\mathbf{I}}, \quad \hat{\eta} = \hat{\mathbf{T}} \times \eta, \quad \hat{\mathbf{I}} = \mathbf{1}/\hat{\mathbf{T}} > 0$$

$$\hat{\mathbf{x}}^{\hat{2}} = \hat{\mathbf{x}}^{\mu} \hat{\times} \hat{\eta}_{\mu\nu} \hat{\times} \hat{\mathbf{x}}^{\nu} = (\mathbf{x}^{\mu} \times \hat{\mathbf{T}}_{\mu}^{\rho} \times \eta_{\rho\nu} \times \mathbf{x}^{\nu}) \times \hat{\mathbf{I}}$$

Hidden symmetry as per EPR Argument

$$\mathbf{x}^2 = (\mathbf{x}^{\mu} \times \eta_{\mu\nu} \times \mathbf{x}^{\nu}) \times \mathbf{I} \equiv (\hat{\mathbf{x}}^{\mu} \hat{\times} \hat{\eta}_{\mu\nu} \hat{\times} \hat{\mathbf{x}}^{\nu}) \times \hat{\mathbf{I}} \hat{=} \hat{\mathbf{x}}^{\hat{2}}, \hat{\mathbf{I}} = \mathbf{1}/\hat{\mathbf{T}} = \text{const} > 0$$

Euclid-Santilli IsoSpaces

$$\hat{\mathbf{r}}^{\hat{2}} = \left(\frac{\mathbf{r}_1^2}{\mathbf{n}_1^2} + \frac{\mathbf{r}_2^2}{\mathbf{n}_2^2} + \frac{\mathbf{r}_3^2}{\mathbf{n}_3^2} \right) \times \hat{\mathbf{I}} \in \hat{\mathbf{F}}$$

Minkowski-Santilli IsoSpace

$$\hat{\mathbf{x}}^{\hat{2}} = \left(\frac{\mathbf{x}_1^2}{\mathbf{n}_1^2} + \frac{\mathbf{x}_2^2}{\mathbf{n}_2^2} + \frac{\mathbf{x}_3^2}{\mathbf{n}_3^2} - \mathbf{t}^2 \times \frac{\mathbf{c}^2}{\mathbf{n}_4^2} \right) \times \hat{\mathbf{I}} \in \hat{\mathbf{F}}$$

R. M. Santilli, "Lie-isotopic Lifting of Special Relativity for Extended Deformable Particles," Lettere Nuovo Cimento **37**, 545 (1983),
<http://www.santilli-foundation.org/docs/Santilli-50.pdf>