

## Heisenberg-Santilli IsoEquation

$$\begin{aligned} \hat{\mathbf{i}} \hat{\times} \frac{d\hat{\mathbf{A}}}{d\hat{\mathbf{t}}} &= \hat{\mathbf{A}} \hat{\times} \hat{\mathbf{H}} - \hat{\mathbf{H}} \hat{\times} \hat{\mathbf{A}} = \\ &= \hat{\mathbf{A}} \times \hat{\mathbf{T}}(\mathbf{t}, \mathbf{r}, \mathbf{p}, \psi, \dots) \times \hat{\mathbf{H}} - \hat{\mathbf{H}} \times \hat{\mathbf{T}}(\mathbf{t}, \mathbf{r}, \mathbf{p}, \psi, \dots) \times \hat{\mathbf{A}} = [\hat{\mathbf{A}}; \hat{\mathbf{H}}]. \end{aligned}$$

## IsoExponentiation

$$\begin{aligned} \hat{\mathbf{A}}(\hat{\mathbf{t}}) &= \hat{\mathbf{U}}(\hat{\mathbf{t}}) \hat{\times} \hat{\mathbf{A}}(\hat{\mathbf{0}}) \hat{\times} \hat{\mathbf{U}}^\dagger(\hat{\mathbf{t}}) = (\hat{\mathbf{e}}^{i \times \mathbf{H} \times \mathbf{t}}) \hat{\times} \hat{\mathbf{A}}(\hat{\mathbf{0}}) \hat{\times} (\hat{\mathbf{e}}^{-i \times \mathbf{t} \times \mathbf{H}}), \\ \hat{\mathbf{U}}(\hat{\mathbf{t}}) &= \hat{\mathbf{e}}^{\hat{\mathbf{i}} \hat{\times} \hat{\mathbf{w}} \hat{\times} \hat{\mathbf{X}}} = \hat{\mathbf{I}} + \hat{\mathbf{i}} \hat{\times} \hat{\mathbf{w}} \hat{\times} \hat{\mathbf{X}} / \hat{\mathbf{1}}! + (\hat{\mathbf{i}} \hat{\times} \hat{\mathbf{w}} \hat{\times} \hat{\mathbf{X}}) \hat{\times} (\hat{\mathbf{i}} \hat{\times} \hat{\mathbf{w}} \hat{\times} \hat{\mathbf{X}}) / \hat{\mathbf{2}}! + \dots = \\ &= \hat{\mathbf{I}} \times (\mathbf{e}^{i \times \mathbf{w} \times \mathbf{T} \times \mathbf{X}}) = (\mathbf{e}^{i \times \mathbf{w} \times \mathbf{X} \times \mathbf{T}}) \times \hat{\mathbf{I}}, \end{aligned}$$

## The Fundamental IsoUnitarity on $\hat{\mathcal{H}}$ over $\hat{\mathcal{C}}$

$$\hat{\mathbf{U}} \hat{\times} \hat{\mathbf{U}}^\dagger = \hat{\mathbf{U}}^\dagger \hat{\times} \hat{\mathbf{U}} = \hat{\mathbf{I}}.$$

## Turning Non-Unitary Transforms into IsoUnitary forms

$$\mathbf{U} \times \mathbf{U}^\dagger \neq \mathbf{I}, \quad \mathbf{U} = \hat{\mathbf{U}} \times \hat{\mathbf{T}}^{1/2}, \quad \hat{\mathbf{U}} \hat{\times} \hat{\mathbf{U}}^\dagger = \hat{\mathbf{U}}^\dagger \hat{\times} \hat{\mathbf{U}} = \hat{\mathbf{I}}.$$

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R. M. Santilli, *Elements of Hadronic Mechanics*,  
 Volumes I and II Ukraine Academy of Sciences, Kiev, 1995,  
<http://www.santilli-foundation.org/docs/Santilli-300.pdf>  
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