



## Cosmic Alchemy

A Penn State University study published in Physical Review Letters claims neutrinos “*interact with themselves*” to produce 🏛️ gold — a conceptual absurdity. A philosophical investigation.









- ▶  $\vec{v} \times \vec{v} = \vec{0}$  (cross product of parallel vectors is zero)
- ▶  $\vec{v} \times (-\vec{v}) = -\vec{v} \times \vec{v} = \vec{0}$
- ▶  $\vec{v} \times \vec{v} = \vec{0}$  (cross product of a vector with itself is zero)

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- ▶  $r \cdot \vec{v} = r \cos \theta$  (dot product of a vector with its projection)
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