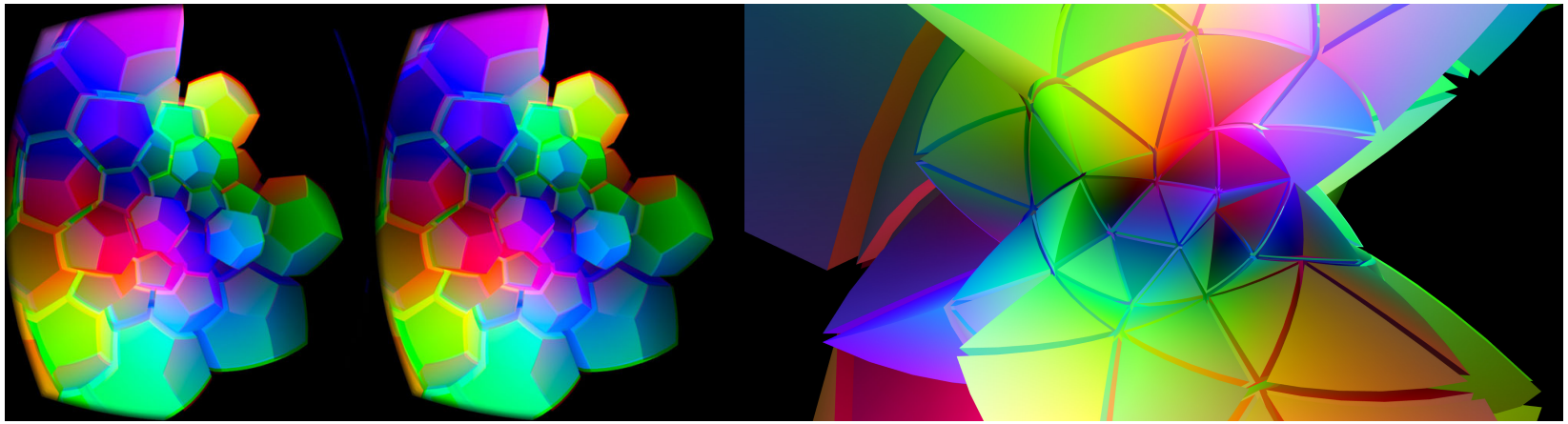

Hypernom: Mapping VR Headset Orientation to S^3

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Communications Design Group
SAP Labs

Andrea Hawksley
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SAP Labs

Henry Segerman
Department of Mathematics
Oklahoma State University

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MTB Design Works, Inc.

Hypernom is a virtual reality game that uses the VR headset (or phone) orientation in an unusual way.

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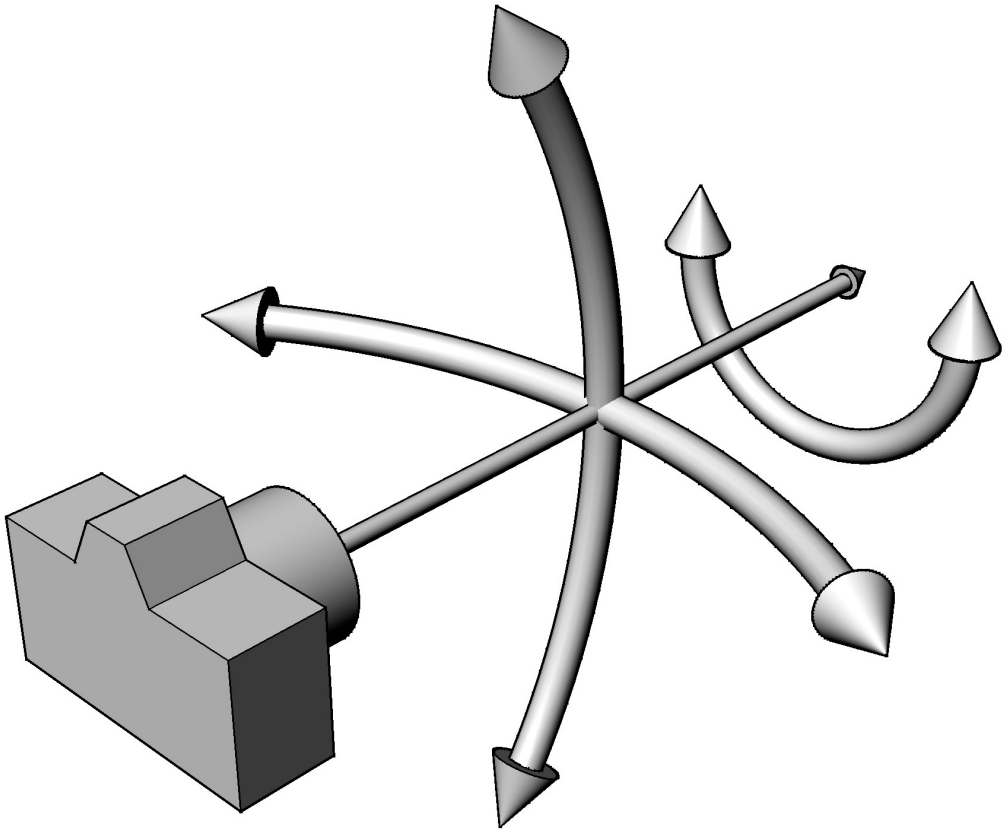

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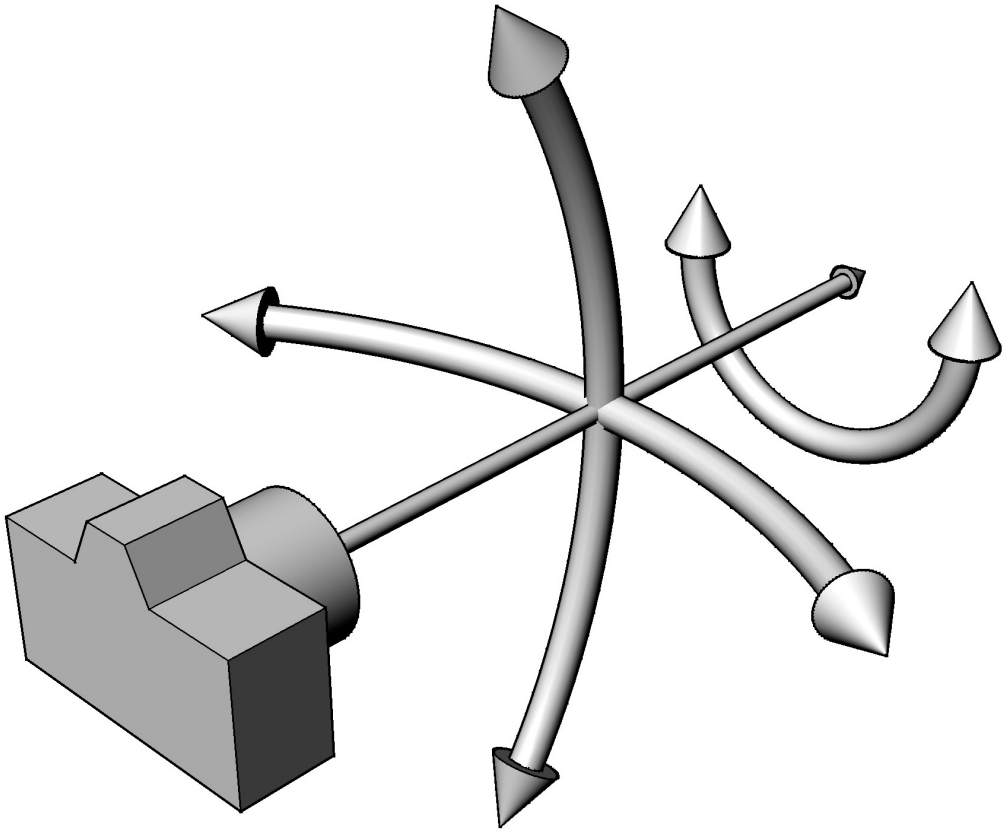
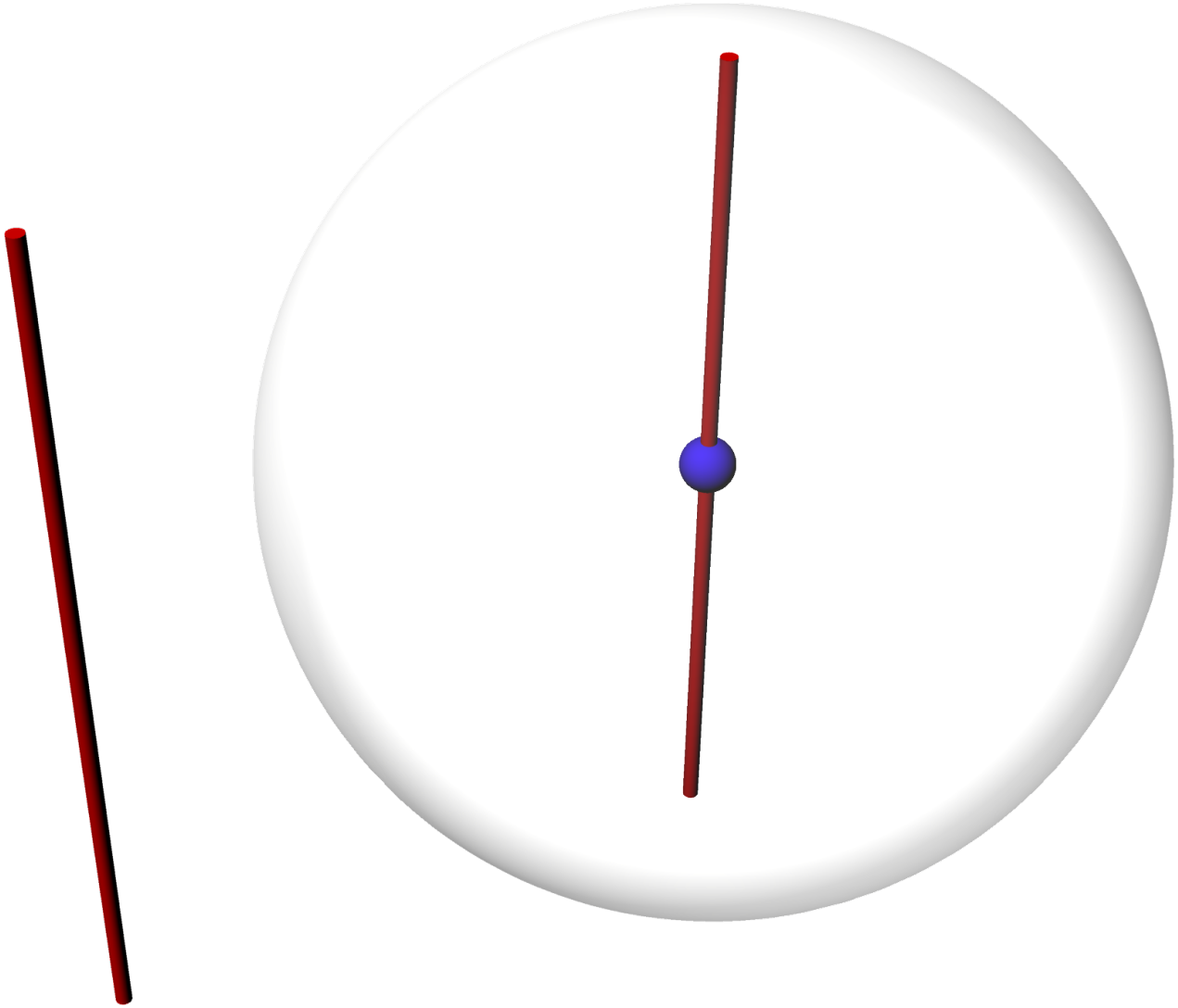


There are three degrees of freedom in the orientation of a headset (or phone, camera, etc.).

The idea of Hypernom is to use headset orientation to navigate the player through a three-dimensional space.

The set of all orientations fits in a ball



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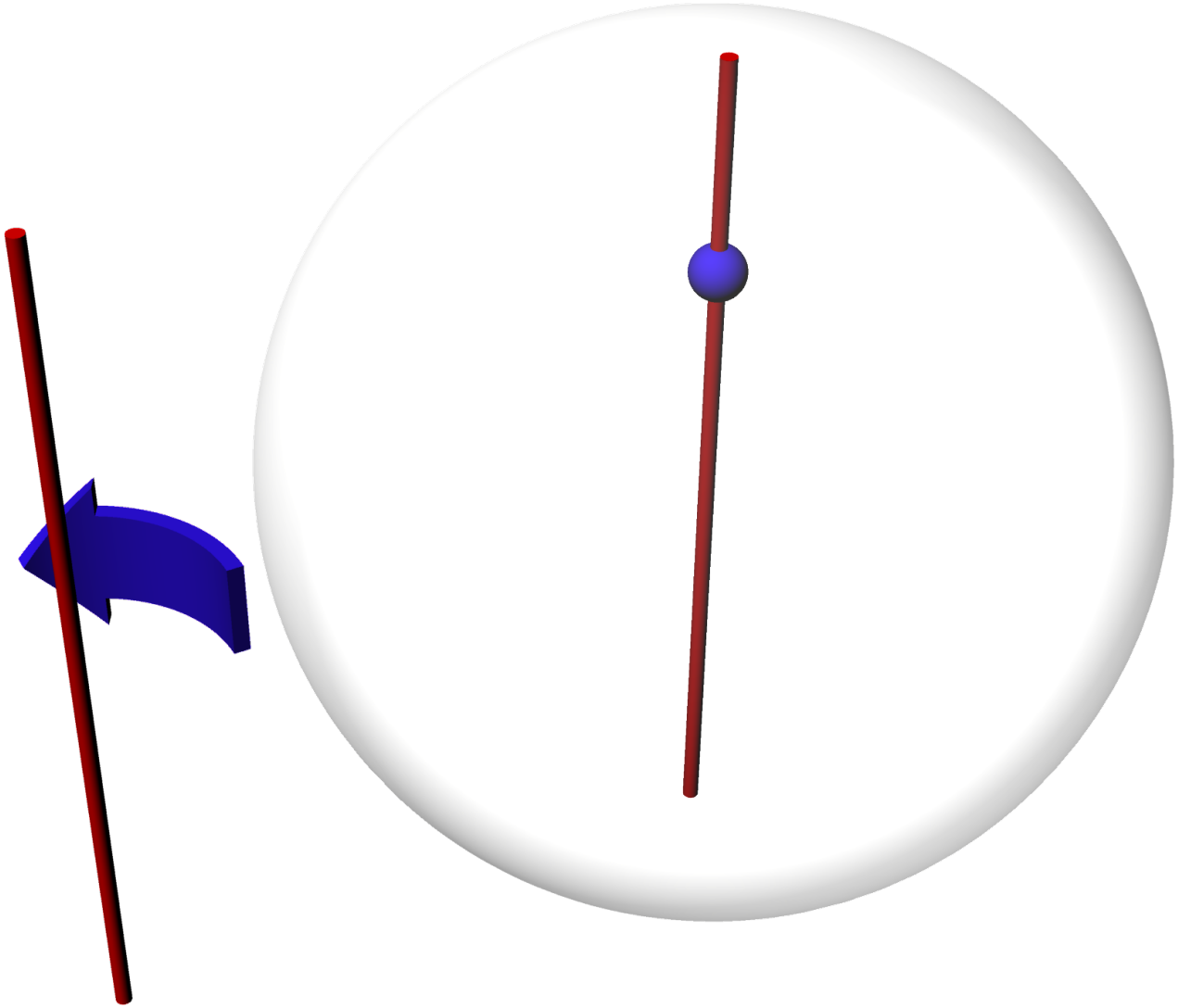

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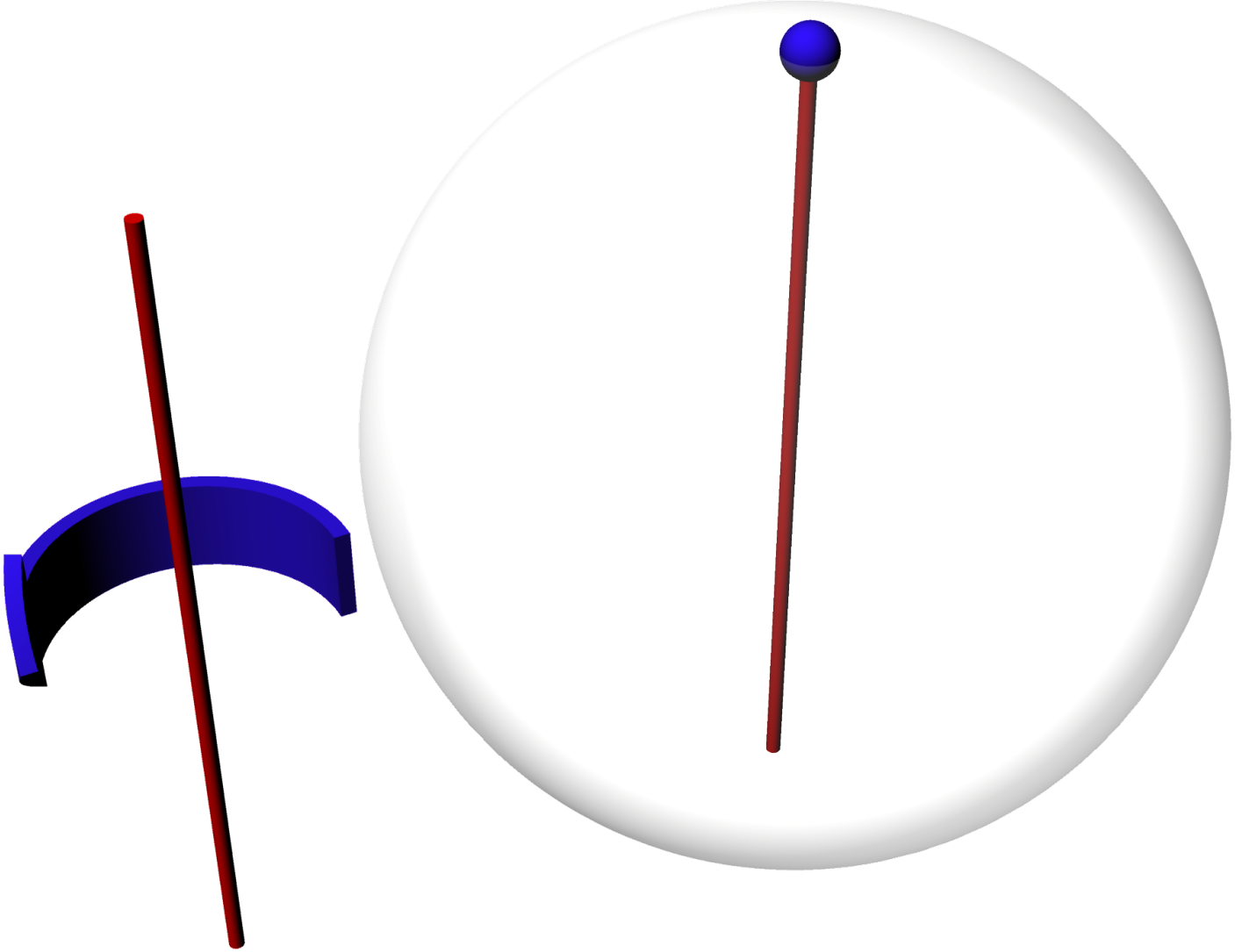

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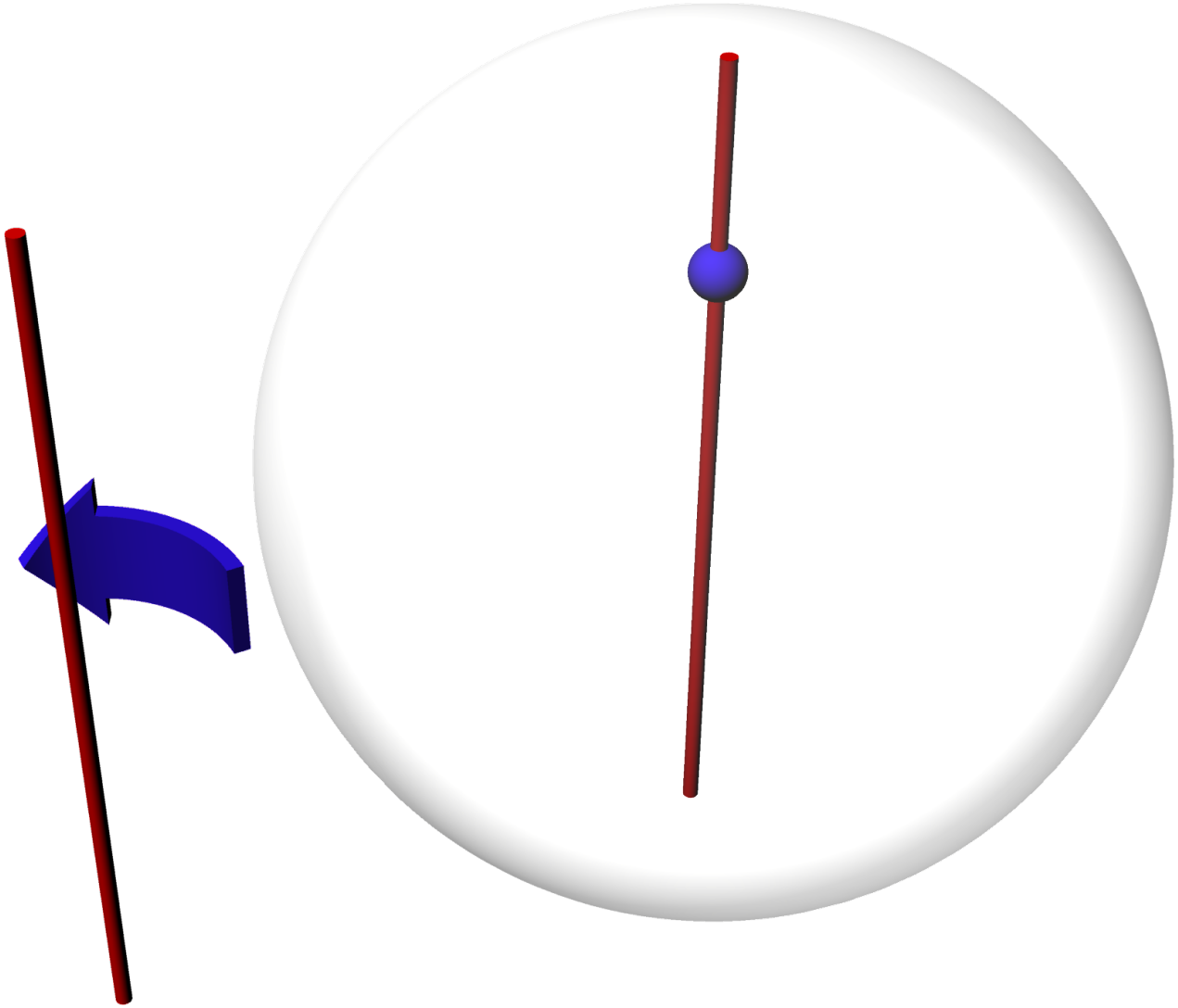

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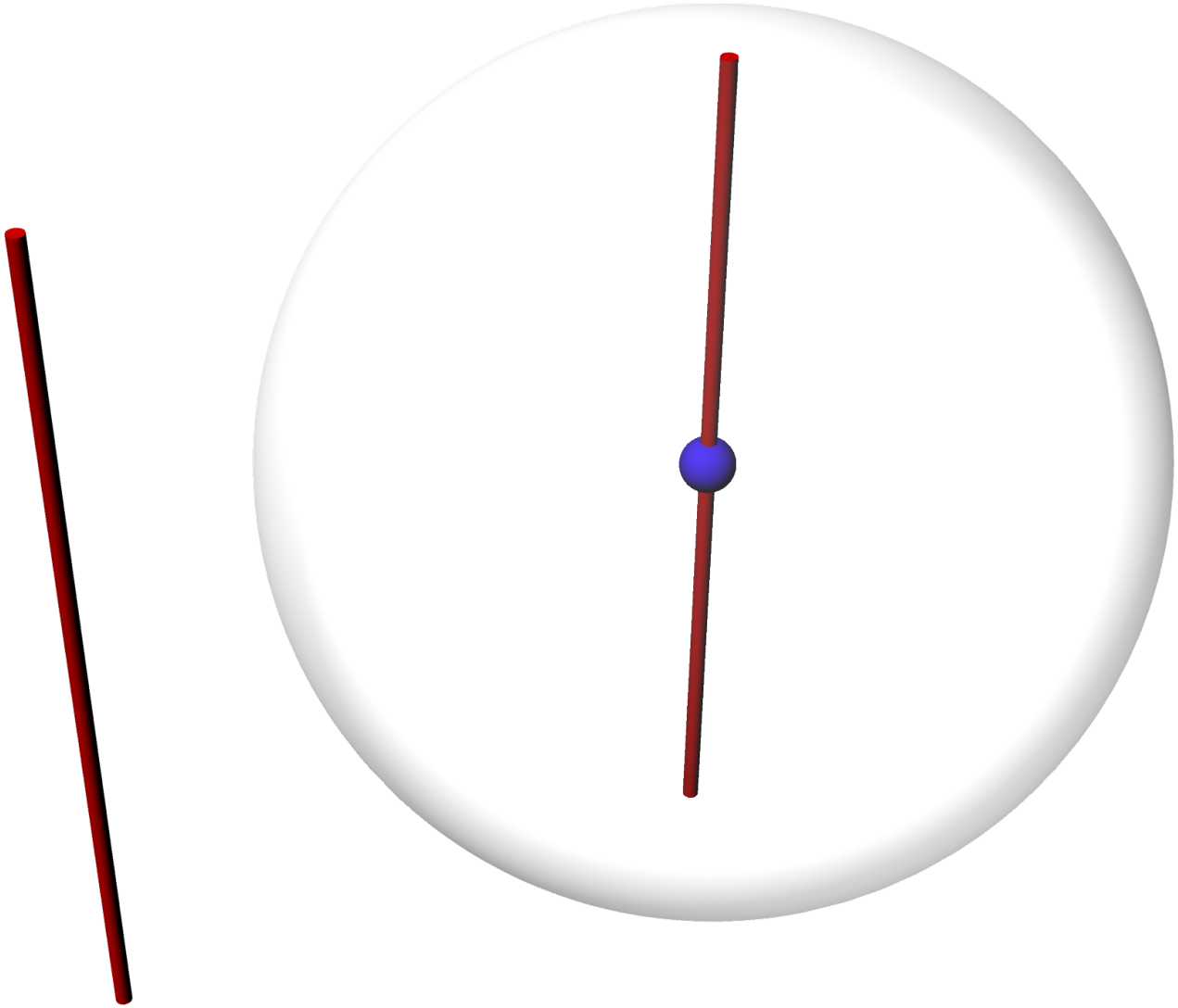

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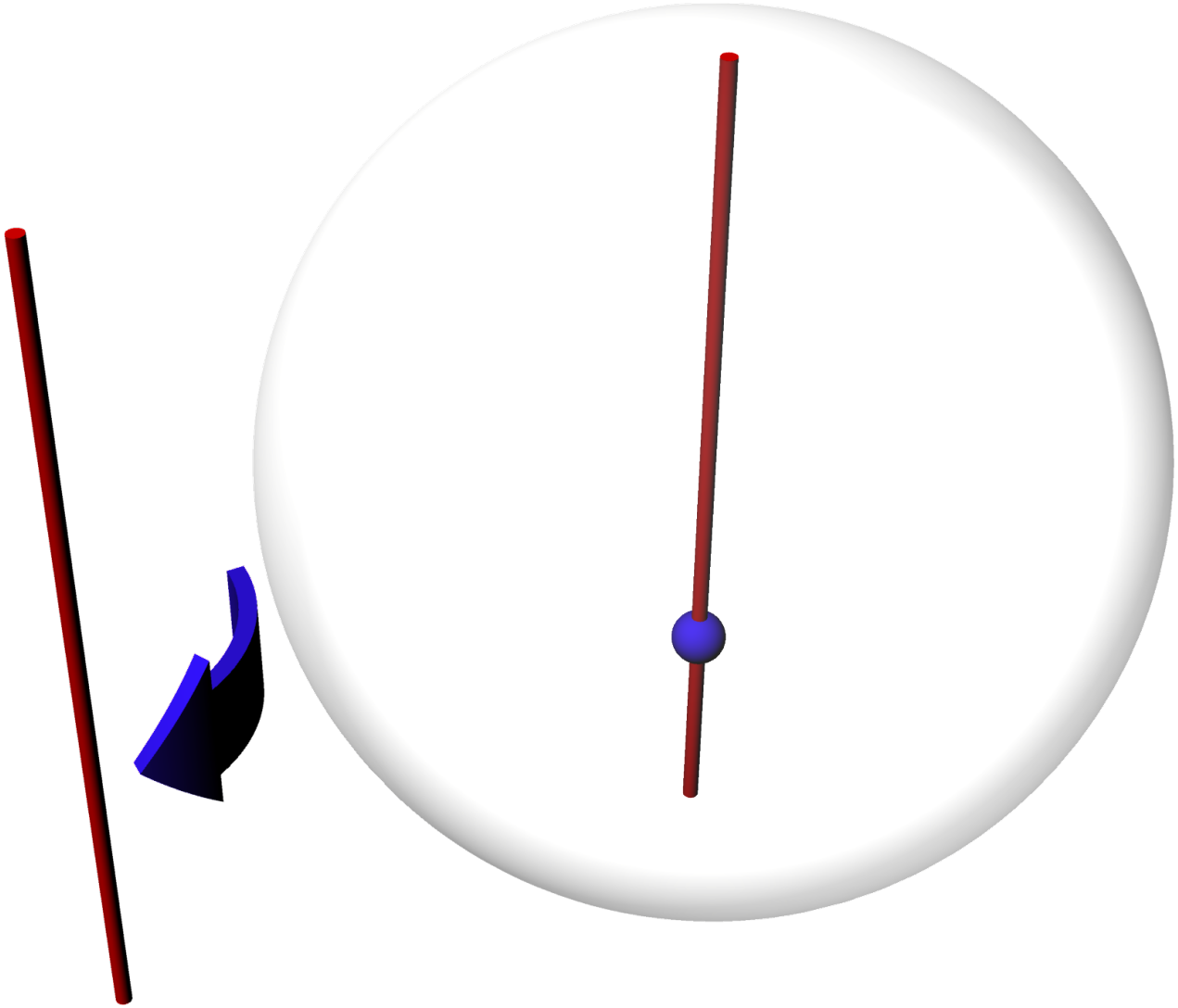

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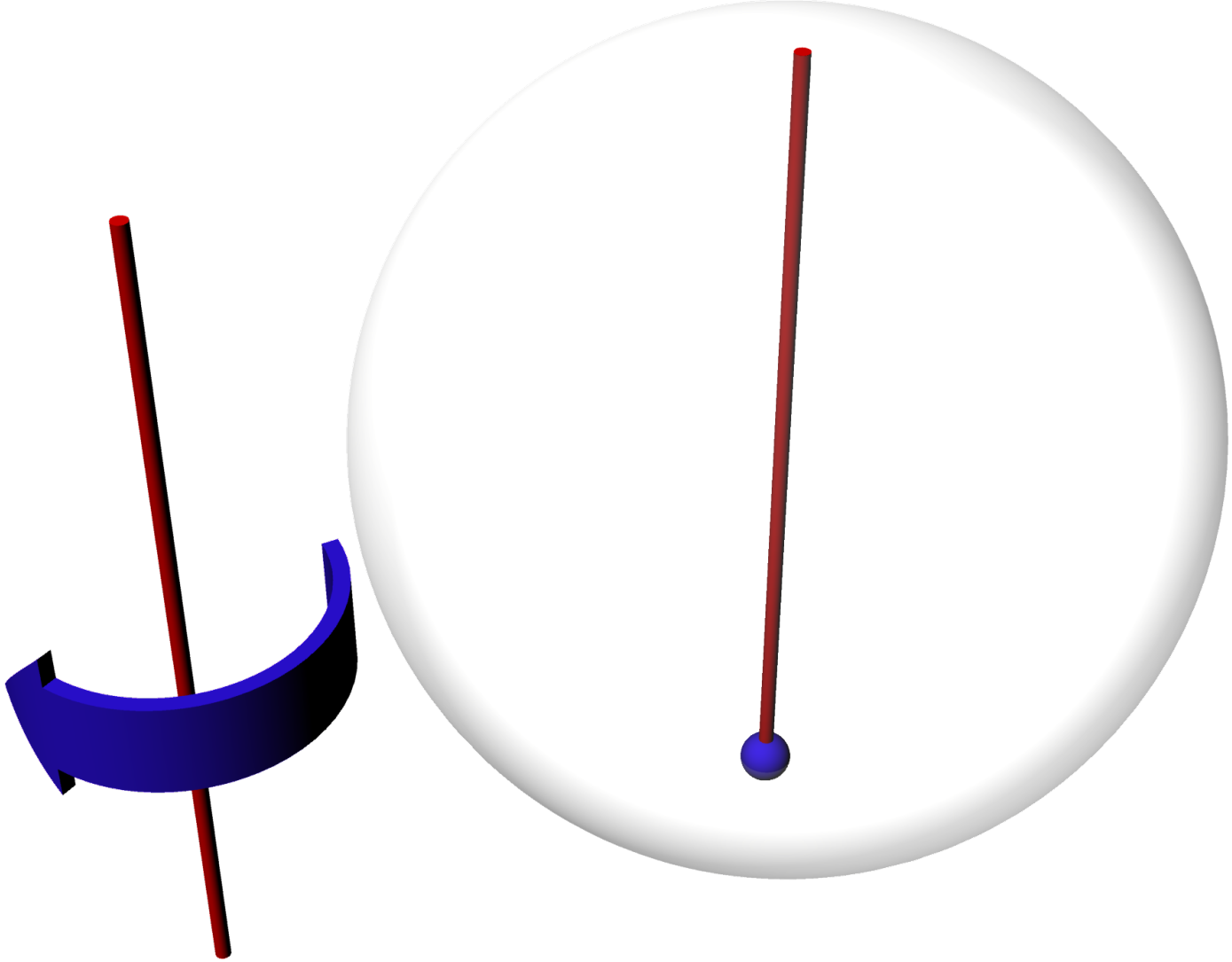

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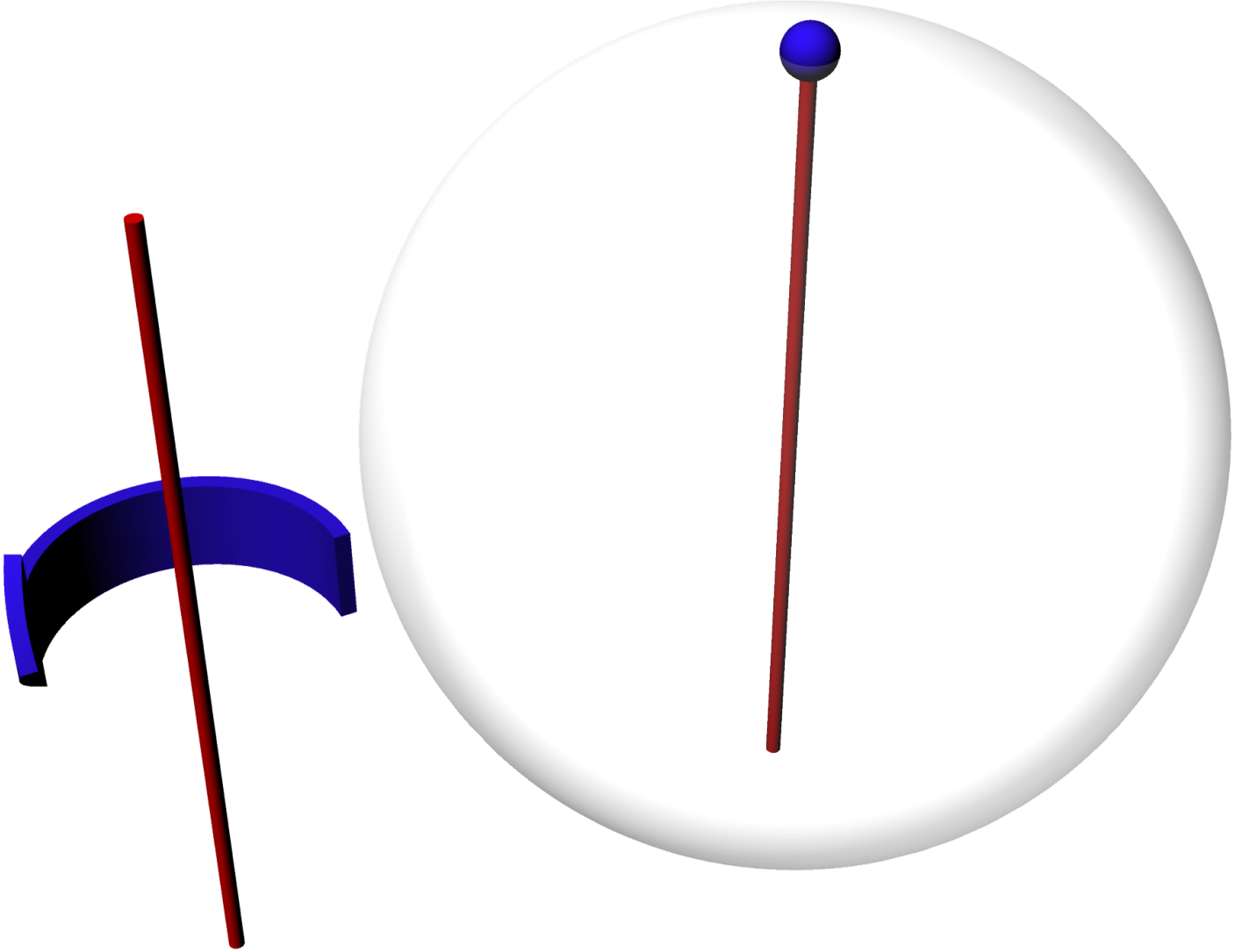

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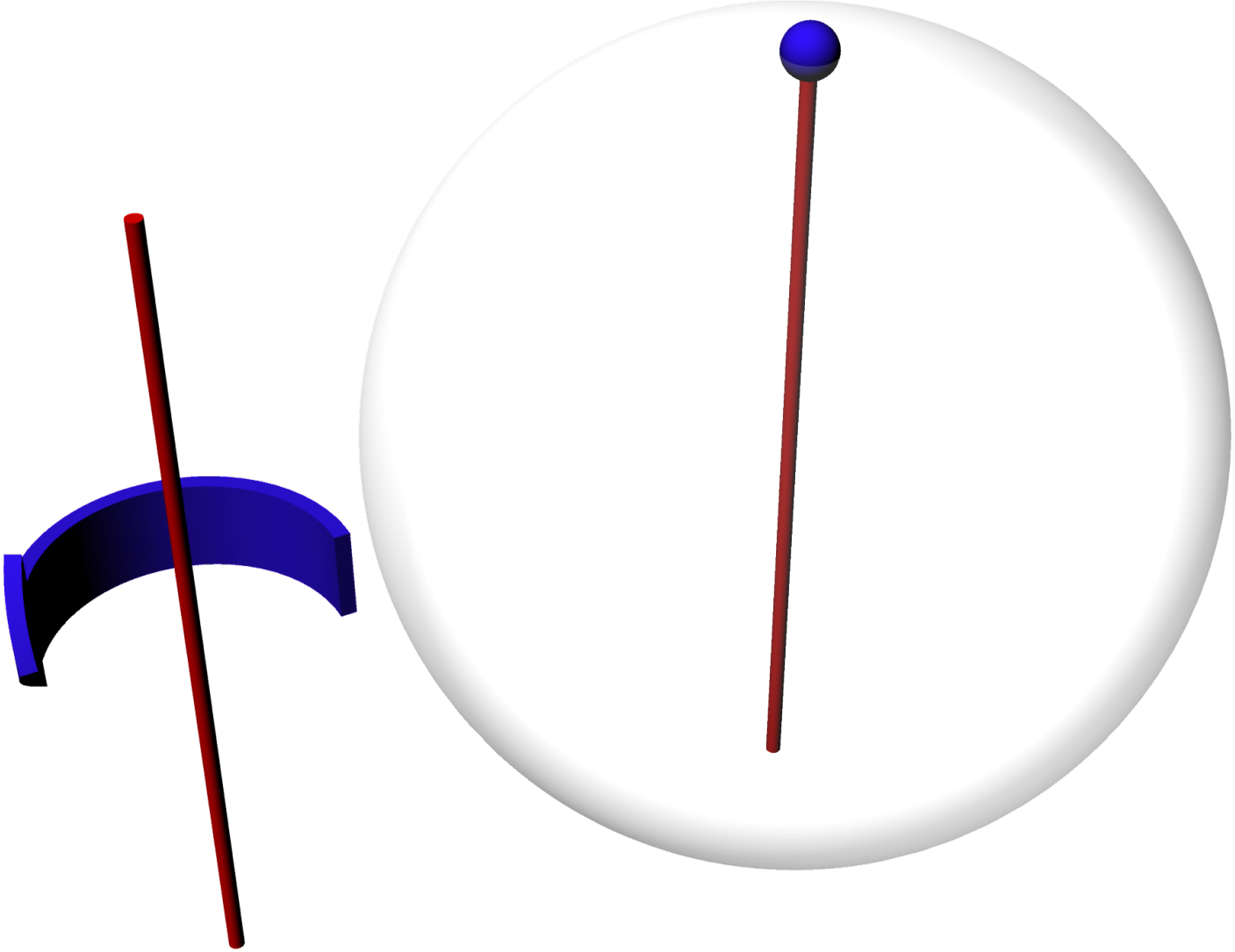
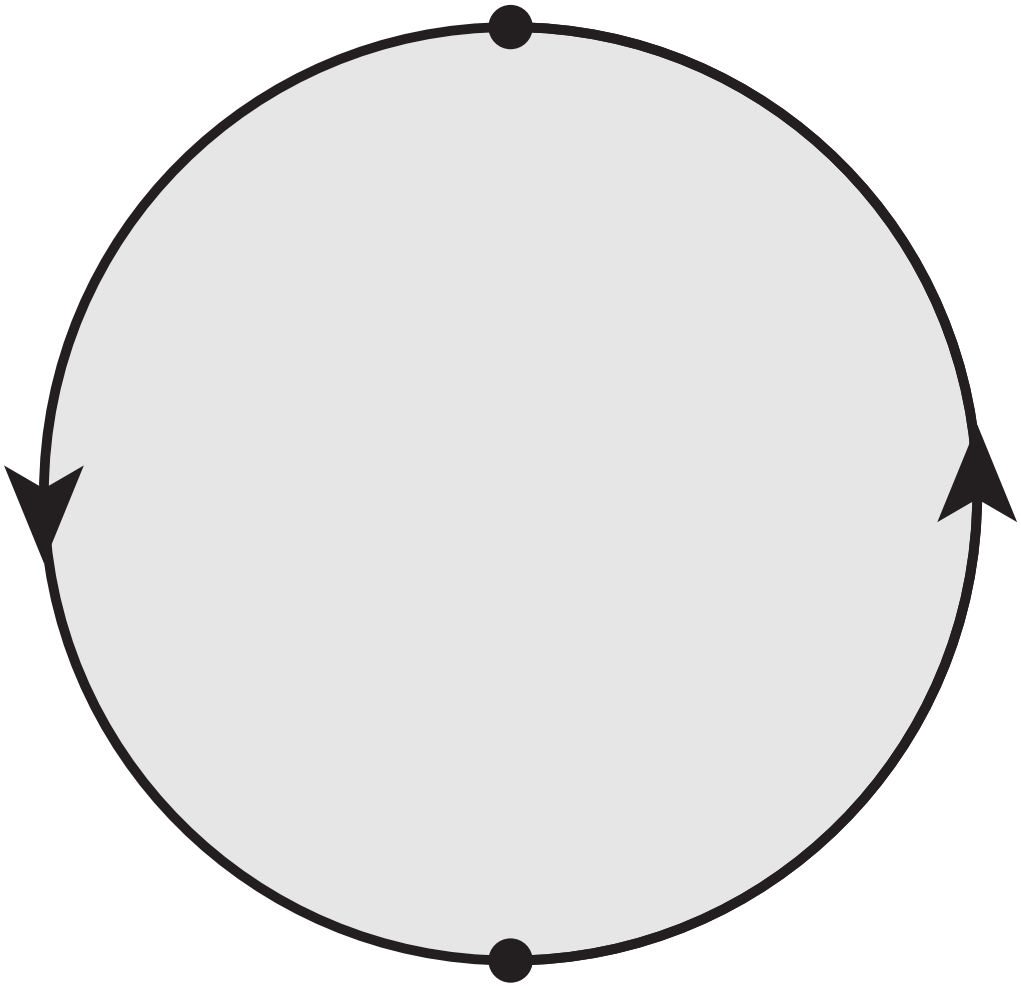


Opposite points on the boundary of the ball are identified, so the space is real projective space, $\mathbb{R}P^3$.

The same construction of gluing opposite points on the boundary of a disk makes the real projective plane, $\mathbb{R}\mathrm{P}^2$.



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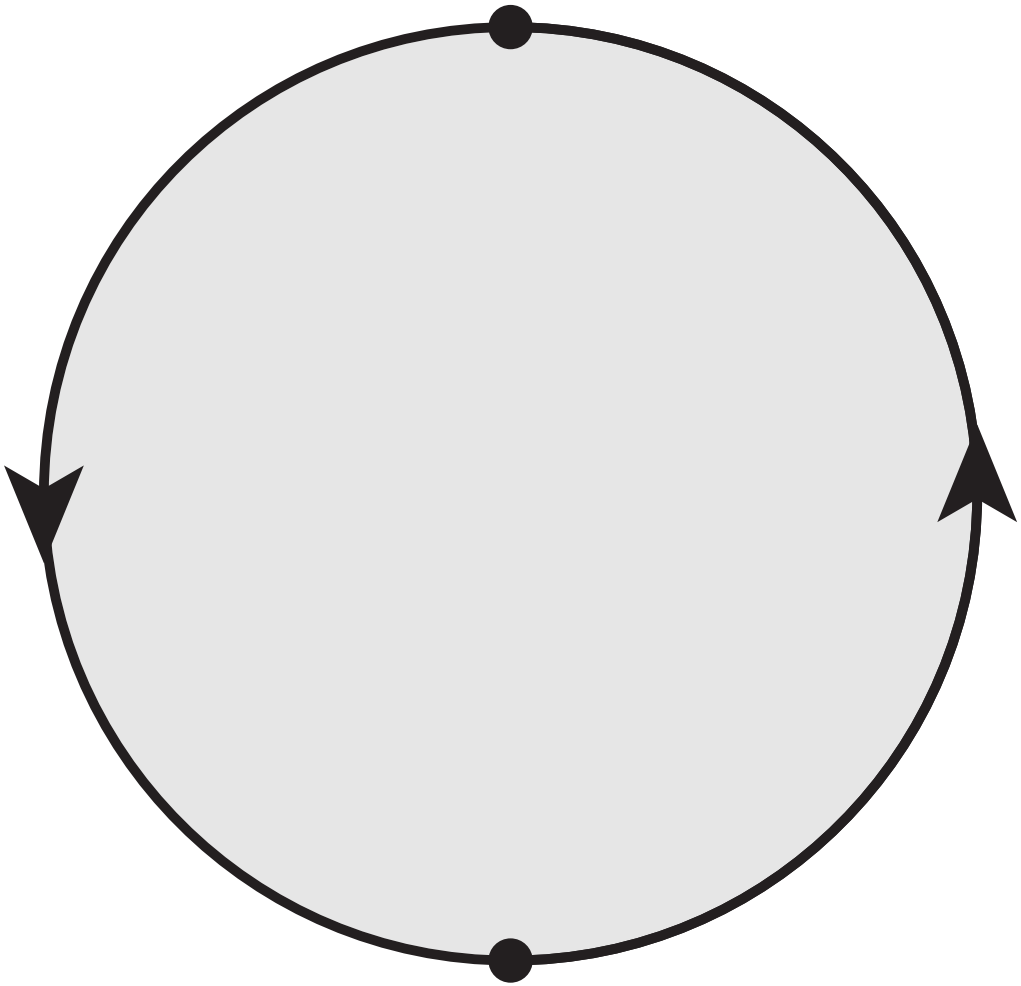
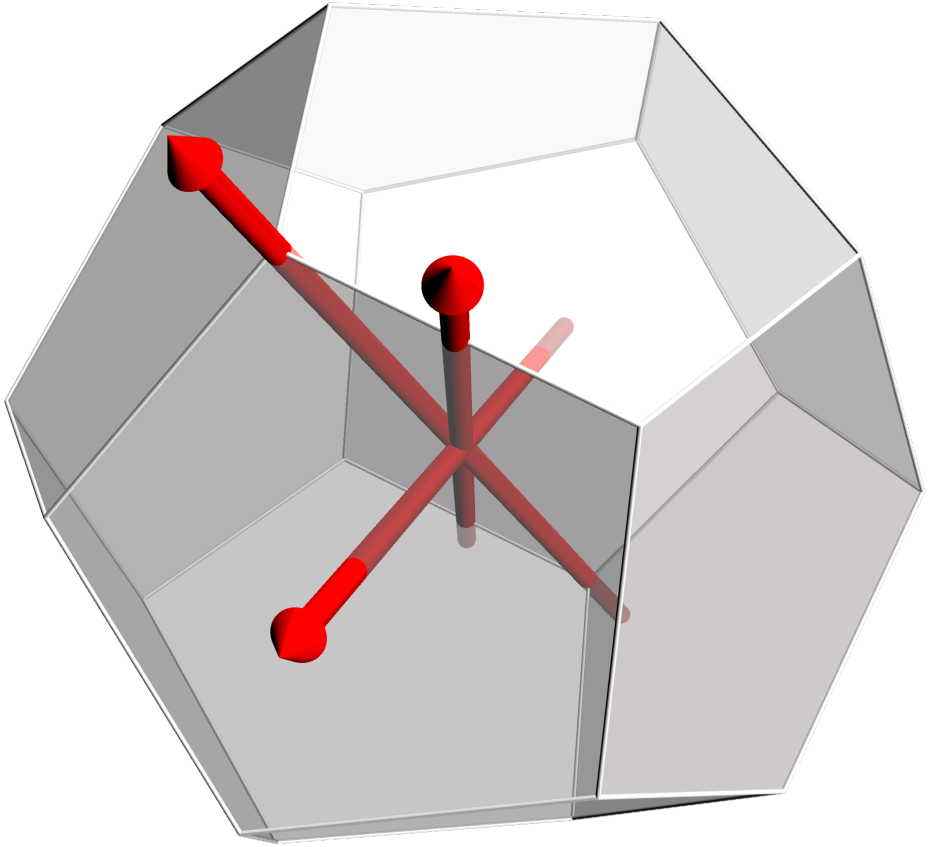
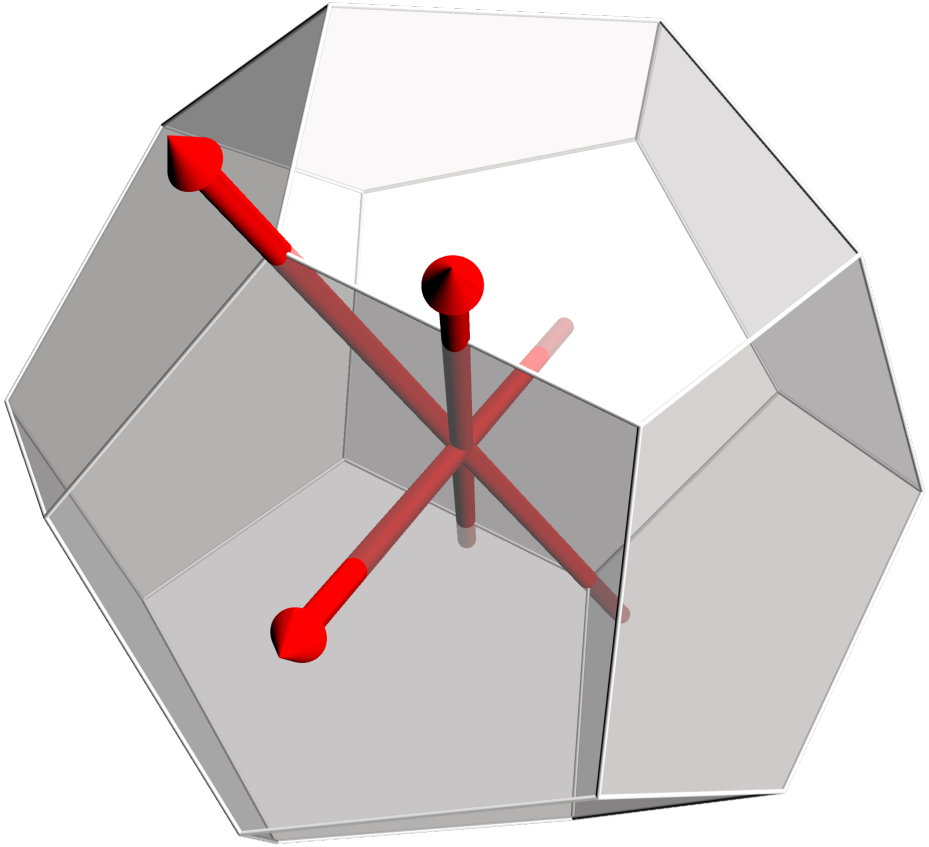


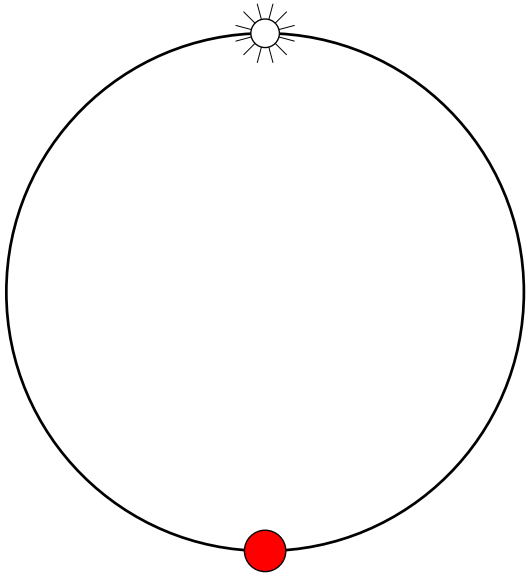
$\mathbb{R}\mathrm{P}^2$ is double covered by the 2-sphere, S^2. In the same way, $\mathbb{R}\mathrm{P}^3$ is double covered by the 3-sphere, S^3.

120-cell hypernom instruction manual



120-cell hypernom instruction manual





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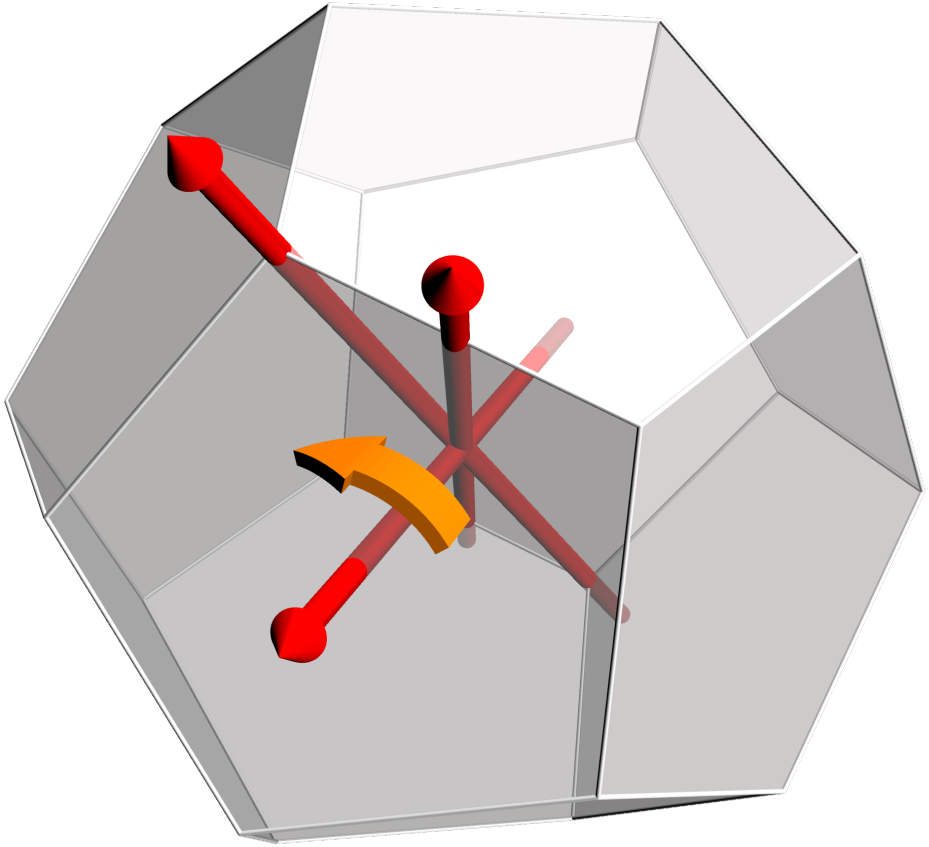

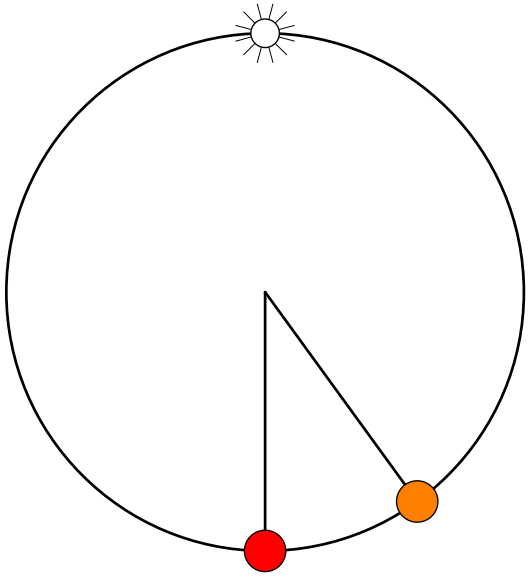

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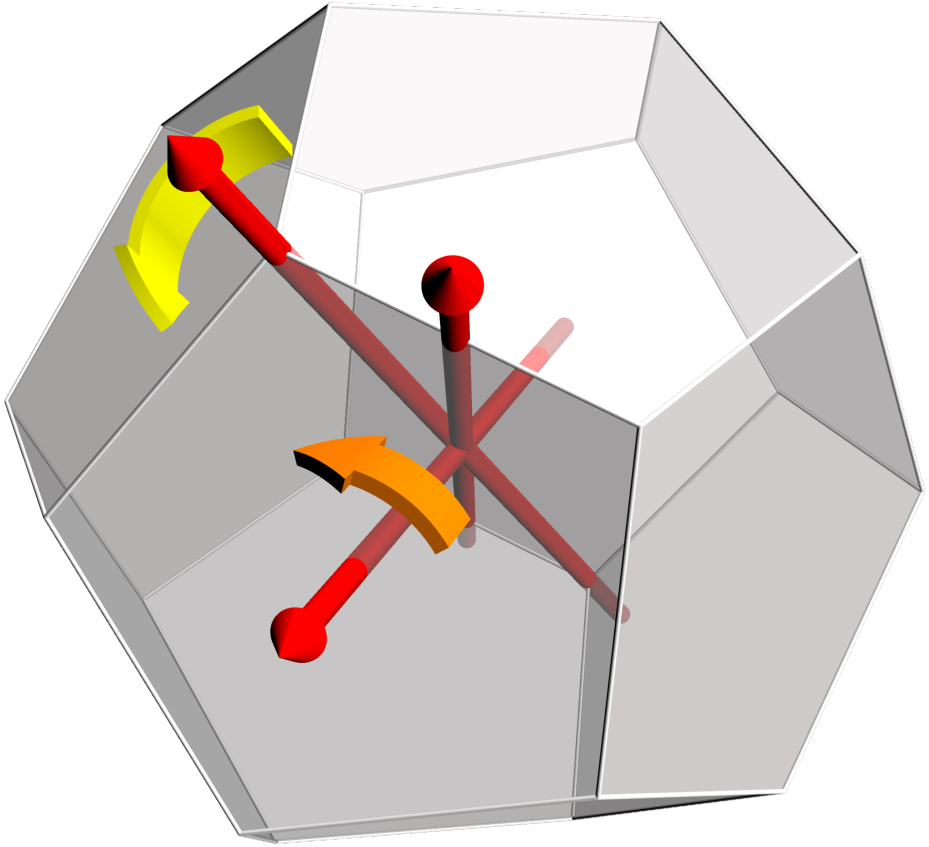

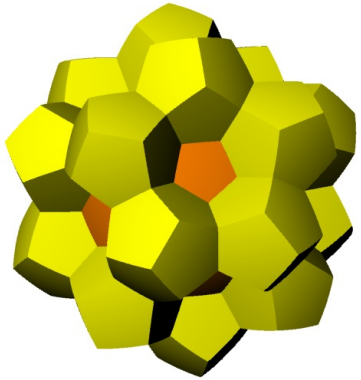

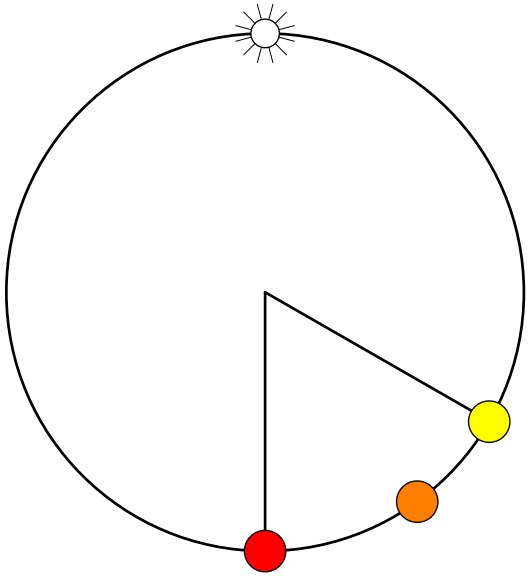

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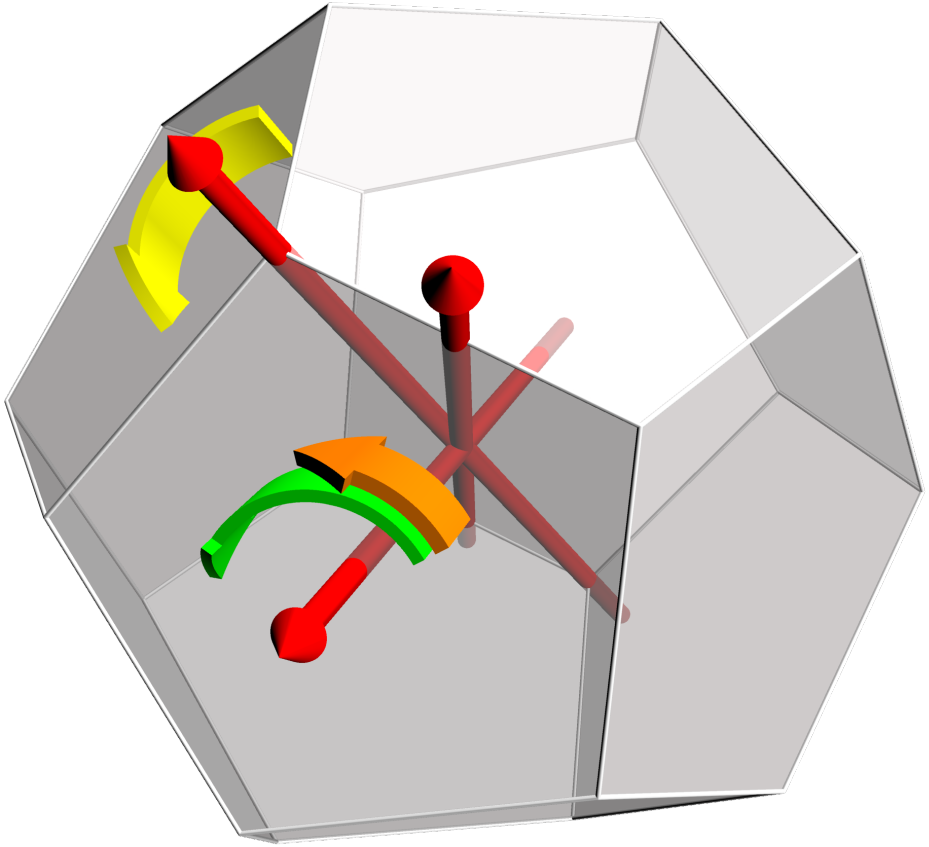

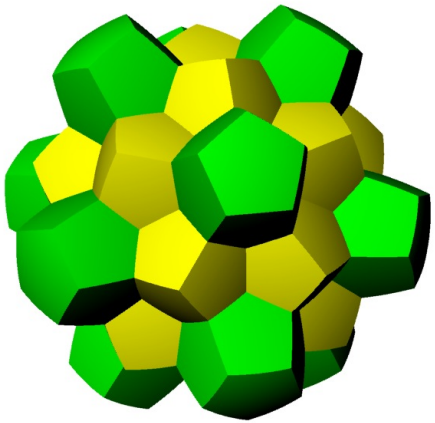

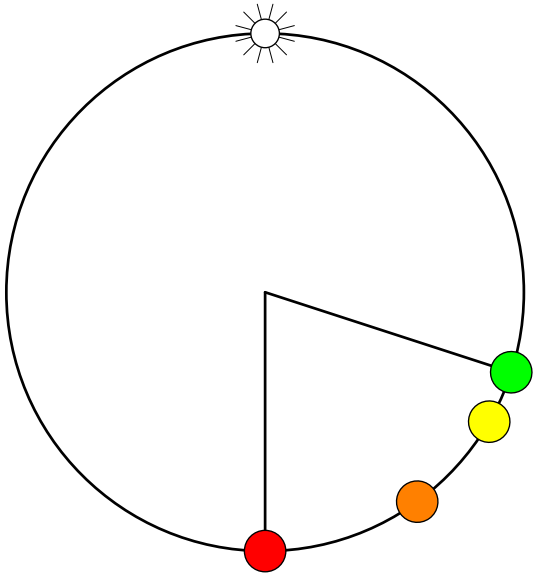

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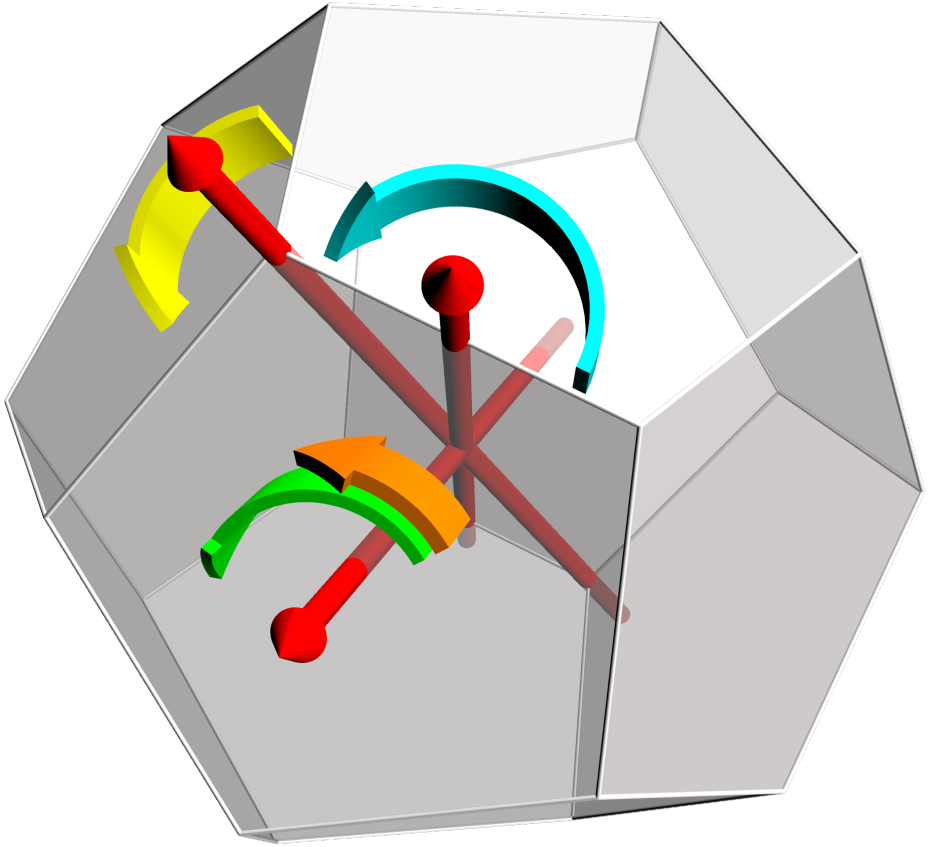

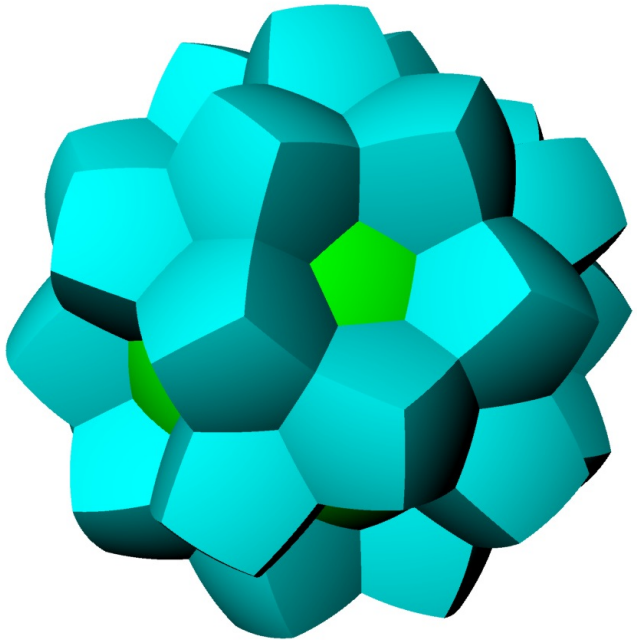

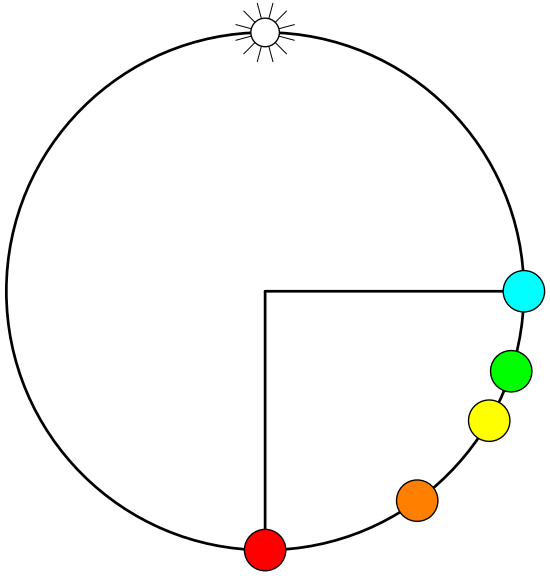

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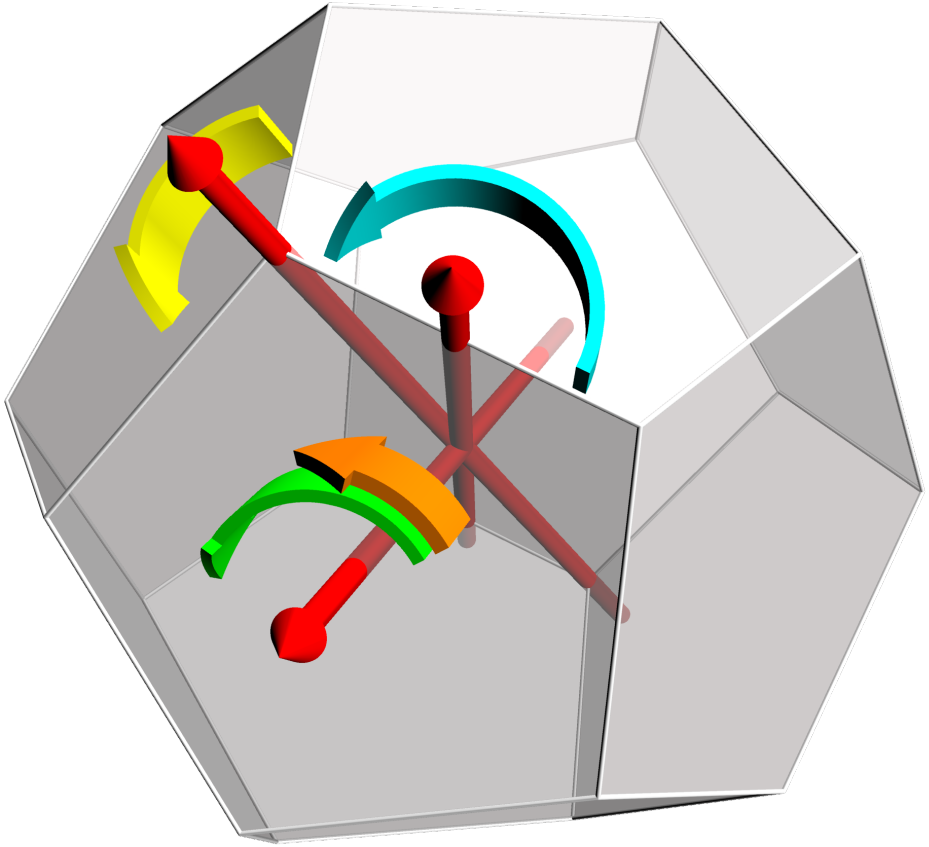

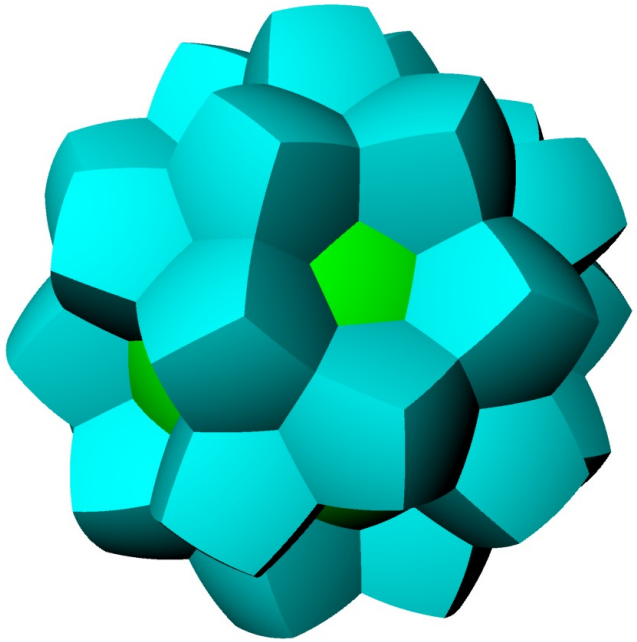

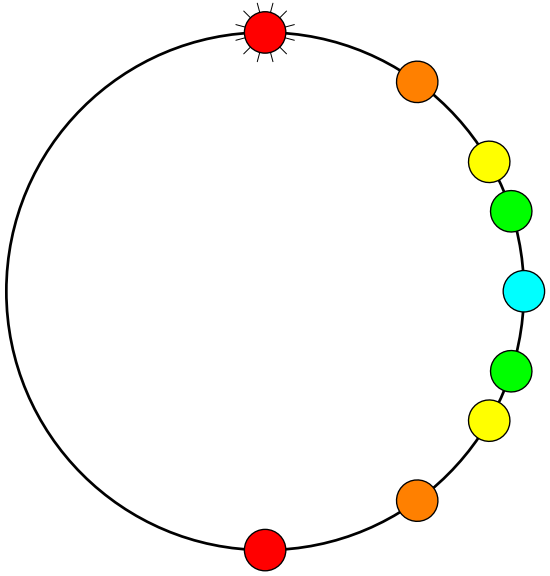

hypernom.com

- Works on iOS, Android and desktop
- Source code at `github.com/vihart/hypernom`