This tabletop experiment is part of the **17/08/2024 article**
"The Observable Structure of 4-Dimensional Perspective Cone Projection".
It was executed using the projection technique outlined in that article.

Oostende, Belgium
May 29, 2025

The full article (dated 17/08/2024) is available at: https://www.twoeyedmonocularvision.com/_files/ugd/52edc2_53dcc30f6d264ee0bdc867a3f573044e.pdf

The tabletop experiment explores the direction of a coordinate axis denoted as *w*. It was carried out by John Post P., an independent researcher specializing in optics and projection geometry. The documentation includes Photograph 1 and Photograph 2, both taken on 24/05/2025.

For further information, contact the researcher via e-mail at: bimonocularvision@yahoo.com or visit the personal website: https://www.twoeyedmonocularvision.com/

4-Dimensional not-distorted cone projection

Isolation of the 4-Dimensional coordinate w-axis

Photograph 1: A metal ring with a circular shape produces a circular shadow cone projection that remains not-distorted, even when cast onto a skewed surface. The central circular opening of the ring similarly results in a circular light cone projection, which likewise remains not-distorted on the same skewed surface. The direction of projection in this experiment corresponds to the coordinate *w*-axis in 4-Dimensional space, as shown in the corresponding illustration.

The 4-Dimensional **coordinate *w*-axis** is prominently featured in the experiment and is represented with a bold black arrow. In contrast, the 3-Dimensional coordinate *z*-axis and its associated cone projection are not dominant in this context and are therefore rendered in gray. 2-dimensional projection and its cone projection, comprising the coordinate *x*- and *y*-axes, cannot be isolated in this context. However, these coordinate *x*- and *y*-axes are still illustrated to provide a practical reference for spatial orientation and explanation.

In summary, the coordinate *w*-axis and its corresponding 4-Dimensional cone projection are clearly isolated in this experiment. Only the coordinate *w*-axis and its projection are dominantly visible and relevant within the setup.

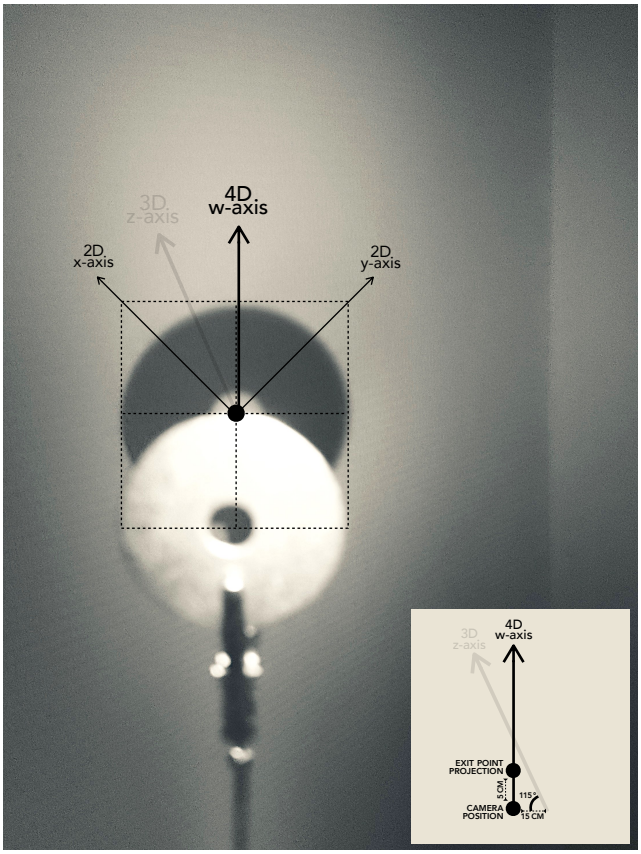
3-Dimensional distorted cone projection

Isolation of the 3-Dimensional coordinate z-axis

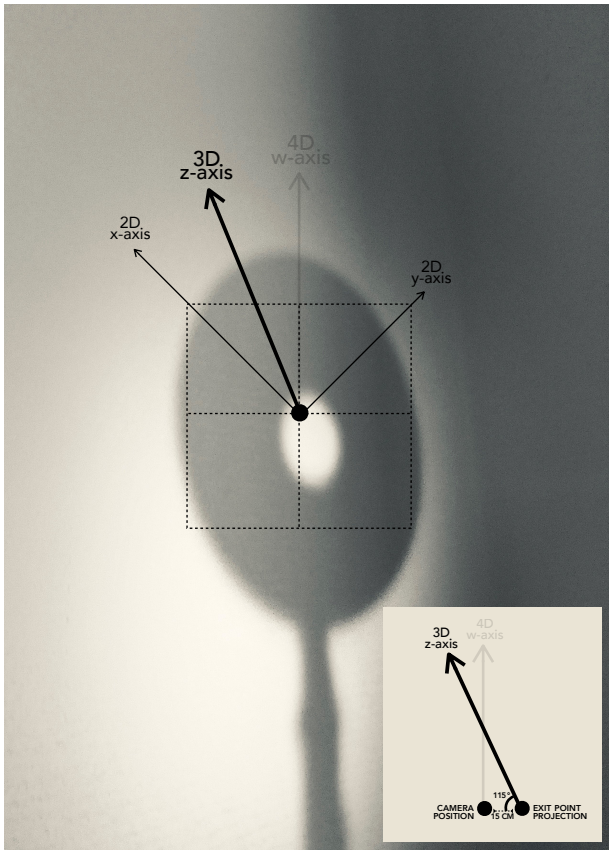
Photograph 2: A metal ring with a circular shape produces an elliptical shadow cone projection that appears distorted, even when cast onto a skewed surface. The central circular opening of the ring similarly results in an elliptical light cone projection, which is likewise distorted on the same skewed surface. The direction of projection in this experiment corresponds to the coordinate *z*-axis of 3-Dimensional space, as shown in the corresponding illustration.

The 3-Dimensional **coordinate *z*-axis** is prominently featured in the experiment and is represented with a bold black arrow. In contrast, the 4-Dimensional coordinate *w*-axis and its associated cone projection are not dominant in this context and are therefore rendered in gray. 2-dimensional projection and its cone projection, comprising the coordinate *x*- and *y*-axes, cannot be isolated in this context. However, these coordinate *x*- and *y*-axes are still illustrated to provide a practical reference for spatial orientation and explanation.

In summary, the coordinate *z*-axis and its corresponding 3-Dimensional cone projection are clearly isolated in this experiment. Only the coordinate *z*-axis and its projection are dominantly visible and relevant within the setup.



Photograph 1 and illustrations of the experiment.



Photograph 2 and illustrations of the experiment.

Materials and Experimental Setup

The following components and conditions were used in the creation of the two cone projections:

- Projection Object: A not-transparent metal circular ring (commonly known as a washer) was selected to create both cone projections. The washer, typically used to distribute the load of a threaded fastener (such as a bolt or nut), had a diameter of 30 mm, a central circular opening of 6 mm, and a thickness of 1.5 mm. It was securely held in place using a metal clamp mounted on a stand.
- Type of Projection: Light beam projection and shadow beam projection.
- Projection Surface: A skewed wall was used as an irregular surface to receive the projections.
- Observation and Recording: A photo camera functioned both as the observational tool and the recording device. It was positioned at various spatial locations and orientations in order to independently document the coordinate *w*-axis and *z*-axis perspective cone projections in isolation.
- Reference Grid: A 30 mm × 30 mm dotted square grid was overlaid on both photographs to enable comparative analysis between the not-distorted and distorted projections.
- Projection Origin Indicator: A small black circular dot appears in the shadow photographs to indicate the approximate position of the camera and projection exit point. This dot represents a generalized interpretation area in physical space, allowing for slight positional variations in both the projection direction and the recording device. The dot symbolizes a spatial tolerance for shifts in directionality and placement during projection and capture.
- Photograph 1: The projection exit point and the camera position are positioned as close as possible to each other, approximately 5 cm apart. In this setup, the projection direction is closely matched to the coordinate axis along which the camera is aimed, ensuring minimal angular deviation.
- Photograph 2: The projection exit point is offset in a direction described as right and slightly downward relative to the camera's position. The distance between the camera position and the projection exit point is approximately 15 cm. In this setup, the projection direction is at an angle of 115°, and is not aligned to the same coordinate axis as the camera.