Space: Its Light, Its Shape.

Day 1 Highlights

Since we were not really working from a text and since we touched on some of the themes of the course, we thought a summary in order.

- We began with a general discussion on Abbott's, *Flatland*, focusing on Chapters 1-3 and 13-19.

- As a way to launch into a little physics, we focused on the problem of determining length in Lineland, as related by the King (Chapter 14, page 48 in the Dover edition). A "zero-dimensional observer" (ZDO) determines length by listening for the sounds of the bass and tenor voices of the King. In the simplest case of an infinite line the ZDO could determine the length of the King using the time interval between the two sounds. This was based on two ideas from physics

  1. *Sound is a wave.*
  2. *Waves travel at finite speed.*

  We will come back to these ideas later in the seminar.

- Life got considerably more complicated when we considered the possibility of a circle "Lineland." To summarize: It is possible to use sound to decide whether the Lineland universe is a circle or a line. We also discussed sound propagation in one-dimension and two dimensions.

- We also had **A Question**: If sound travels only in one-dimension can the ZDO determine the length of the King?

- Towards the end of the class we discussed the Mystery of Non-Intersecting Threads as told in *The Shape of Space*. The key idea was:

  > *Does this observation (that the threads do not intersect) rule out particular shapes?*

  We will be using this idea again and again throughout the semester. For instance, A Square does not live on a place nor a sphere but maybe a torus.