

## Re: Epistemology 201: The Science of Science

**Source:** <http://sci.tech-archive.net/Archive/sci.physics/2005-03/0792.html>

---

**From:** Daryl McCullough (*stevendaryl3016\_at\_yahoo.com*)

**Date:** 03/01/05

Date: 1 Mar 2005 10:18:09 -0800

Lester Zick says...

*>Tony, I probably read about flatland before you were born. And there  
>is no way to picture 4D given our 3D imagining capabilities because  
>there is no 4D hyperspace and that's the reason we have only 3D  
>imagining capabilities.*

We only have direct experience of 3D, but I wouldn't say that our imagining capabilities are limited. You have to practice in order to develop an intuition about higher dimensions.

*>I always wondered why they explained things in  
>two dimensions instead of three since that was where the action was  
>supposed to take place. Then I realized they couldn't explain things  
>and the reason they couldn't is that there is no fourth spatial  
>dimension academic pretensions to the contrary notwithstanding.*

How do you know how many dimensions there are? What you know is that you only experience three dimensions, which means that if there are more than three dimensions, they aren't all the same.

*>Haven't you ever wondered why our imagining capabilities are 3D?*

It's obviously because the macroscopic world of our experience is 3D, and our minds evolved to work in this world. That doesn't imply anything about what is true of the universe in extreme situations beyond our experience, the world of the very small and the world of the very large.

*>Well, Tony, there are two answers. The first relates to whether 4D  
>space actually solves problems like the omnidirectional cosmic red  
>shift. The fact is that it doesn't unless we're at the center of the  
>universe because spatial and temporal metric eccentricity of any  
>dimensionality implies directionality and not omnidirectionality.*

That is simply incorrect. There is no mathematical difficulty with describing an expanding 3D geometry with no center of expansion. It's just that such a geometry cannot be a \*Euclidean\* geometry.

>*The second answer is more subtle and depends on what I term the*  
>*commensuration of space in dimensional terms. In other words we can*  
>*commensurate lines, planes, and solids to one another mathematically*  
>*but not higher or lower dimensioned figures to lines, planes, or*  
>*solids. This is where dimensionality comes from and what it means.*

Are you trying to say that it is \*mathematically\* impossible for there to be more than 3 dimensions? That's incorrect. Mathematicians have studied higher-dimensional geometry for a couple of hundred years. There is no mathematical difficulty.

--  
Daryl McCullough  
Ithaca, NY