

## CONVERSATIONS IN ASTRONOMY AND COSMOLOGY

Among the drawbacks with online teaching/learning is the absence of in-class conversations. Experience has taught me that these chats are often more valuable than formal lectures.

Normally I begin each in-person class with a discussion that recaps previous topics, and this will often take up the first twenty minutes or so of a two-hour class.

This goes to the overarching goal of this class: As I mentioned in an earlier video lecture, if we do this right you will walk out of this class with a clearer understanding of how the universe works than that of 99% of the people you meet. Not a bad proposition, I would think.

But to get to that level of comprehension, however requires something that I feel is often overlooked in college courses, and it's this:

To have comprehensive grasp of a topic, you have to be **conversant** in the topic, which is to say that you have to be able to talk about the topic **off top of your head**. When you can do that, then and only then do you **own it** - and then it's yours forever. And yes, that's the goal.

You have to also recognize that you can't do this all at once. The human brain just doesn't work that way. The way to do this is a piece at a time. Galileo, when he created what we now call "the Scientific Method," referred to this as "limiting the scope of inquiry."

The Navy S.E.A.L.'s, in one of their unofficial mottos, describe it this way:

Q: How do you eat an elephant? A: One bite at a time.

Another way of looking at this goes this way: Knowledge is not just about regurgitating factoids. Hell, I can get a parrot to do that. In the teaching biz we call that "binge and purge education." Actual knowledge is about taking all those factoids and stitching them together in a cohesive and cogent narrative, creating an understandable story.

I'm reminded of a couple observations from "Big Al," AKA Albert Einstein.

He said - and I'm paraphrasing - that the purpose of college is not to fill you with facts but rather to teach you how to think.

I agree.

His other observation went this way: "If you truly understand something, then you should be able to explain it to the barmaid."

(Yeah, I know, that's a bit sexist. But we'll cut him some slack and recognize the era in which he said it. It still contains a large kernel of truth.)

So, back to the course topics.

I'm going to add a page on the website called "ASTR Weekly Expectations." Each week I will list items that I want you to be able to nail verbally, conversationally. We'll do them in small doses until eventually you will have at your disposal a coherent base of knowledge that's part of your DNA.

Find someone in your circle - or reach out to a classmate - with whom you can have "conversations."

I promise it will make this endeavor more fruitful.

Start talking!