

Meet a Scientist: Dr. Flip Tanedo

Meet Dr. Flip Tanedo! He is a scientist who studies **physics**. Physics is the study of matter, motion, energy, forces, and more. Flip is a type of scientist called a **particle physicist**.

Flip studies small particles, which can be described as the building blocks of matter. He studies the mysterious **dark matter** that helps form our galaxies. Dark matter is thought to make up 85% of matter in the universe but we don't know much about it!



No scientist works alone; Flip leads a team of students in a quest to learn where dark matter came from. They also seek to learn how to study dark matter in a laboratory.

Did you know that Flip is the first particle physics professor of Filipino-American heritage? We interviewed Flip to learn more about him.

What was your childhood like? Did you like science?

Like most kids who grew up in the 80s and 90s, I watched a lot of television. My favorite shows featured science or scientists in creative ways. I liked educational shows that taught about science. I also liked science fiction shows like *Star Trek: The Next Generation*. (Star Trek is a fictional show where a group of voyagers explore space.)



Star Trek

The shows I loved led me to develop a respect and admiration for science and made me want to become a scientist.

Ultimately it was *Star Trek* that made me a physicist! I read a book called *The Physics of Star Trek* and was smitten with the idea that many science fiction ideas in the show were inspired by actual science being done at the time.

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Describe a typical day at your job.

I spend most of my time bouncing ideas off of other physicists. We might talk about our ideas in person, over email, or on the phone. After so many years doing science, physicists develop very specific expertise in certain parts of our field. This means we rely on each other's knowledge in order to answer big questions about dark matter! No one person can answer the questions alone.

A key part of scientific progress is being able to communicate effectively. The most important part of this is having a knack for asking the 'right' questions.

Describe a time in your career that something did not go as planned.

I was a science fan for as long as I could remember, but I didn't really become a scientist until college. In college I started doing research as an undergraduate assistant in a materials science lab. When I started working in that lab, I had this idea about how a "good scientist" should be.

I thought a "good scientist" should be able to figure out the correct answer right away, similar to how studying hard leads to finding the correct answers on exams. However, science is nothing like an exam. In fact, science is more about the process of being confused, trying something out, failing, and then learning from the results of your failed attempt. It took me a long time to appreciate that these "failures" are actually an essential part of science. It is in the failures that one learns deep things about science and nature.

What advice do you have for students today?

Science isn't about knowing the answers to questions. Science is about the journey of discovering those answers by poking and prodding nature in different ways. It's a guessing game where you will "fail" many more times than you "succeed," but those "failures" are how we develop insight. Making mistakes is part of the path.

*Did you know?
Flip uses a lot of math for his
job! He also uses his
knowledge of light waves,
sound waves, forces,
properties of materials,
space, and more!*