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A Note from the Author

My Papa showed me the stars in the constellation Orion when I was 10 years old. Ever since then I have been captivated by astronomy... though never wanted to be an astronaut even as a 'child of the 60's't. Astronomy was very important, and a constant source of inspiration and excitement. I was also a very big fan of science fiction, reading about 30 novels a year from grade 8 through 12, and so my astronomy experience as a teenager was part fact and part fantasy. Science fiction acted like my 'battery' to drive my curiosity about astronomy even further.

Unlike my friends in school, I actively sought-out the inspiration and awe of the night sky, even from my suburban environment in Oakland California. No one else really seemed to 'get it', or if they did, the experience to them was 100% religious with no element of genuine curiosity about what they were seeing. My curiosity about space compelled me learn huge amounts of facts and information from age 10 to 18, at ever increasing detail and complexity. As a teenager, I had no access to the mathematical-side of astronomy, but I just assumed through my readings that I would encounter it soon enough if I continued my interest.

: Learning math for me was generally a frustrating process with lots of tears. My parents were unable to help me with geometry, algebra or advanced math, and there weren't any tutors available, so I had to struggle through it as best I could. I was a B-average student in math, with very occasional As through grade 11, but then an amazing thing happened. In my Senior year in high school, I took an advanced math 'pre-calculus' course but by January we were learning differential and integral calculus.

I totally fell in love with calculus, and when I went to college at U.C. Berkeley the next year in 1971, I got straight As in calculus and advanced math. So, after all that grade-school frustration, I had finally persevered and discovered just how beautiful math is, and especially how it applied to physics and astronomy. There were now plenty of books and research journals in the college library that revealed the exciting math connections in astronomy. As an undergraduate at UC Berkeley, I concentrated on physics and math almost exclusively. You cannot do very much in physical science without being fluent in mathematics because 100% of the data is numbers and 100% of the interpretation of that data uses equations and other tools in mathematics to look for patterns and logical relationships.

Today, on a typical day, I use algebra and calculus in my work, so you have to be absolutely fluent in understanding how to 'speak' this language... and it is indeed a language. It has an alphabet (numbers and variables), sentences (equations) and you use it to tell stories or write poetry (laws, hypothesis or theories). Only some of the many stories (theories) endure (proven correct), however, so you always have to be prepared for some degree of failure!

Sincerely,

*Dr. Sten Odenwald
Space Math @ NASA*