



## Dr. Robert Megginson – Mathematician

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Though I was raised far from the lands of my maternal grandfather's people, I have always taken pride in my Lakota heritage. I grew up in the farming community of Sheldon, Illinois, with two sisters and a brother who are all younger than I; and to this day I prefer not to live in large cities. As a professor at the University of Michigan ([www.umich.edu](http://www.umich.edu)) and yet a resident of a rural area fifteen miles from campus, I have been happy that my career choice has allowed me to steer clear of living in a big city.

When I was an undergraduate at the University of Illinois ([www.uillinois.edu](http://www.uillinois.edu)), my cultural background was such an oddity that people were more curious about it than anything else. I do know that it affected my worldview quite a lot. For example, I dislike the Native American sports mascot at Illinois, Chief Illiniwek, which led to some uncomfortable encounters. Also, I was raised to have particular values that were not always appreciated by others. I learned to respect elders, understanding that they can reveal wisdom to you. Thus, I interacted with my professors differently than did many of my peers. I was not familiar with the style of learning that was more interactive, where you had to speak up and let the professor know that you had the answers. In many cultures people are not taught to stand out from the crowd and strive to make themselves noticed; so at times teachers may think quiet students are not learning or that they are not interested. However, just because you are quiet and perhaps do not always raise your hand in class, it does not necessarily mean that you are not a good student.

I changed fields several times during my journey from my Bachelor of Science degree to my doctorate. Though my first degree was in physics, after graduation I took a job in computer programming. While working as a programmer, I learned that my real interest was in mathematics and the teaching of it to others. Since a doctorate in the subject seemed to be the way to do that, I entered graduate school at the University of Illinois in 1977. I received a master's in statistics and a doctorate in mathematics over the next six years. What do I study in mathematics? Spaces.

You live in a world that has four dimensions, because you can move forward-backwards, sideways, and up and down. Those are the three space dimensions. But don't forget the other dimension, time. As a mathematician, my main mathematical focus is functional analysis, a branch of mathematics concerned with spaces having infinite dimensions! This is a difficult concept to consider, but mathematicians have developed tools to tame infinity. I have also recently published a graduate level textbook entitled *An Introduction to Banach Space Theory*. Banach spaces include the space that you live in as well as spaces of infinite dimension.

I am seriously concerned with the problem of extreme under representation of minorities in mathematics. To help remedy this, I spend my summers working directly with Native American middle and high school students on the Turtle Mountain Chippewa (Ojibwa) reservation in North Dakota. My responsibilities to them are to further their interest in mathematics and to help them understand the importance and cultural relevance of mathematics. For instance, in the Ojibwa language there is a wonderful way to attach suffixes to counting words to indicate not just the number of items being counted, but also something about the nature of the objects being counted. As an example, rather than referring just to two blueberries, an Ojibwa speaker could talk about *niizho-minag miinan*, two three-dimensional organic blueberries, where

the fact that the two (niizho) blueberries (miinan) are three-dimensional and organic is implied by the suffix minag. The fact that these distinctions are important when counting in the Ojibwa language conveys vital information about the traditional values of Ojibwa culture. This helps the students understand more about their own culture and the place of mathematics within it.

Students should know that learning is not just the road to a better job: it can also be fun. When taking mathematics courses (and I encourage you to take as much mathematics as you can), you should ask your teachers to tell you interesting things about the material and its history, since this really is exciting stuff.

As a final piece of advice, don't ever let anyone tell you that you can't succeed, or that you will at most be second-rate. I have had that happen to me, and I firmly believe that hard work and determination will pay off in the end bigger than anyone could ever imagine.