# Professor Amos Nur, Ph.D

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*Professor Amos Nur (left) with Professor Santamarina, KAUST, February 2017*

Emeritus Professor Amos Nur is a world leading authority in the area of Seismic Reservoir Stimulation and rock physics and has held an association with Stanford University that has spanned over four decades. Raised on a farm which provided the foundation for his interest in geology, he received his Bachelor of Science (Geology) from Hebrew University, Israel and went on to obtain his Ph.D in Geophysics from MIT in 1969. Professor Nur has published over 240 papers and has mentored countless Ph.D students throughout his outstanding career.

The Energy Geoenergineering Laboratory (EGEL) at KAUST was privileged to host Professor Nur in early 2017. He generously permitted our students and staff to conduct an extended interview on the interests and wisdom of an academic great.

*I'm fascinated in understanding about how we got to where we are in terms of our concepts, our thinking and our perspectives in science.*

**Q. What prompted your shift in focus from geology to geophysics?**

There were two facets about geology that, at the time, began to make me feel uneasy. It felt inconclusive and I wasn't able to prove anything. I heard the term 'geophysics' and it sounded right. It was only much later that I began to appreciate geology. Geophysics is a tool that helps us to find partial answers about the earth but the big questions really come from geology.

**Q. What do you see as the difference in the field compared to when you started forty years ago?**

When I got my Ph.D in geophysics, it was a small and emerging field. There were lots of opportunities and possibilities. There are now many Earth Science programs and many areas are becoming mature. Funding in the U.S is very difficult with so much competition. The American Geophysical Union meeting is a good example of this. It used to take place in one hotel and about 150 papers were presented. The last meeting had 24000 attendees!

**Q. What research areas are you passionate about?**

I am fascinated in relating earthquakes to archaeology, introducing interactive movies into earth sciences and the historical aspects of earth science.

When I retired, I discovered that I had so many files of projects or ideas that I thought I would start. And I realized how many of them I'm not going to do because there's not much time left. I decided to select these three projects and focus on them.

*I realized how many of them I'm not going to do because it's too much and there's not much time left.*

In the case of relating earthquakes to archeology, there's no hard science but it is incredibly interesting. I visit these archaeological sites and when everybody looks at what's still standing, I look at what's fallen.

At the moment, we write papers about processes, whether its mountain building or diagenesis or propagation of an earthquake. So it's very difficult in my opinion to envision the process from reading about it. But by using movies in earth sciences, we would not only be far more educational, but it would give us insight into geological processes.

My third interest area is the historical aspects of earth science. For example, it's less than 150 years that we've understood that earthquakes actually happen on faults. It took another 100 years to understand that big earthquakes occur on special faults which are plate boundaries. I really love exploring the history of thinking about it. And then I ask myself, why did it take so long to figure it out?

**Q. You mention that you have lots of ideas, but are running out of time to study them. How do you balance between thoroughly exploring a problem and studying as many problems as you can?**

I do not think I ever figured out how to balance it. I think over these interesting questions, and when I see a gap, a micro gap, an opening here, I follow it. But there were many times when I got stuck at the next step. So it is a real challenge, to take a complicated system, and identify these or some sets of components, that allow you to produce something manageable.

**Q. What do you think are the major unanswered questions in geology?**

I think that the most fundamental questions involve tectonic plate movement and the science behind this, given that plate tectonics is the most important revolution in earth sciences. We still have to prove it and there are many inconsistencies.

Another topic that I am interested in are the physics of earthquakes. There are so many basic questions that are not answered. What determines how large and how long are the ruptures are on the earth? We are still unable to predict earthquakes.

**Q. How do you achieve a 'work-life' balance?**

Looking back, I can tell you how I should have done certain things. In my case, my wife is there to make sure it is reasonably balanced.

**Q. What keeps you motivated?**

Well this sense of curiosity. I got curious about all these puzzles and gravitated towards unanswered questions.

**Q. What provides you with personal and intellectual satisfaction? What advice can you give our students?**

Some people tell you that you should do what makes you happy. I always disagreed with this line of thinking. First of all, happiness changes from case to case. You should do something you find satisfying, even if it is difficult but it is something that is satisfying. I always tell my graduate students that when they work on their thesis, at least half of it has to be safe. In the sense that it should involve some measurements or observations that are solid.

So in my case, that was selecting the important scientific or intellectual questions. For me that is satisfying.

*Motivation? It's this sense of curiosity*