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# Meet the AIM Scientific Board

## Hee Oh: “Mathematics is Beautiful”



A few years ago, when Hee Oh's son was in the fourth grade, he decisively told his mother that it is a good thing she's a mathematician and not an elementary school math teacher. "I can't multiply numbers or add fractions correctly," she admits. And, in fact, it took her a long time to discover her penchant for mathematics.

"Until high school, I never thought I liked math," Oh said. "I had trouble understanding why double negatives become positive or why the sum of two sides of a triangle has to be greater than the third side."

As a grade school student, the South Korean native was convinced that mathematics was, in fact, quite contradictory to the real world. But one day in high school, she came home from school with a debilitating headache. Her sister later found her working on math problems. "Didn't you say you had a headache?" her sister asked. "Yes," Oh responded, "but I forget the headache when I am working on math problems."

When stiff competition kept Oh out of medical school after graduation, she took her elder brother's advice to study math instead, since there were many diverse career possibilities with a degree in math.

"At that time, I didn't even know there was a profession where one could make a living out of solving math problems," Oh said. "In retrospect, I thank God that I didn't go to medical school. I cannot stand seeing blood. And I love being a mathematician."

Oh tells that, in her first Calculus class, the professor wrote on the board, "Mathematics is beautiful."

"I was a bit shocked to see that," Oh said. "But it made me even more curious about mathematics. How could it be beautiful? I had to find out. Gradually, I found that I could see its beauty, and I could even find it for myself. It was fascinating! I still find great joy in understanding something I didn't understand before."

Oh went on to earn her Ph.D. from Yale University and to work and collaborate in Germany, the U.K., Israel, and various institutions in the U.S. She

has worked for the past several years as a professor at Brown University. Earlier this year, she took a new position as the first tenured female professor in the Yale University mathematics department. She is also a devoted wife to her husband, Seong-June Kim, and mother to 12-year-old Yoon-Young and 6-year-old Joy, which, at times, has been a source of some interesting challenges as she learns to find a balance between mathematics and motherhood.

She recalls one time when, asking a senior female professor for advice, the professor told her that she herself had quite prudently waited to get tenure before getting pregnant with her first child.

"Since I wasn't tenured at that time and was already pregnant with my first child, I could only look down at my big tummy and sigh, 'oops,'" Oh said. "But, in retrospect, I am glad that I didn't wait too long for my first child. Children give us so much joy and happiness."

Oh went on to add that mathematics actually has certain advantages as a career for a mother, because mathematicians tend to have more flexible schedules than many other professional careers. She has also learned how to use time more effectively and, thanks to some helpful advice from Peter Sarnak of Princeton University, has found a key element in the search for balance between mathematics and motherhood.

"My four years at Princeton were crucial for my career," Oh said. "Peter Sarnak had a huge influence in my mathematical interests, and exposed me to automorphic forms and analytic number theory. But he also gave me a key piece of life advice that I want to share with other young mother mathematicians."

"Buy as much help as you can with money," Sarnak had told Oh right after her first child was born, before promptly helping her hire a weekly cleaning person.

"You spend money on help with household chores, which frees up time to work on math," Oh explains. "And if you prove good theorems, you get promoted and your salary increases. So it is a great investment."

As a member of the AIM Scientific Board since 2010, Oh has thoroughly enjoyed having the chance to keep up with mathematical happenings in fields outside her own.