

## Featured Researcher

### Professor Young Dong Kim



Like many, Professor Young Dong Kim discovered ellipsometry as a student doing materials research. He was working on his Ph.D. studies of Zn(Mn,Fe,Co)Se at the University of Illinois Urbana-Champaign, when he decided to build an

ellipsometer. After visiting David Aspnes at Bellcore, he built a similar rotating analyzer ellipsometer. While final accuracy remained a problem, his understanding of ellipsometry developed beyond the competence of a mere operator. Professor Kim's ellipsometer allowed observation of a clear separation of the  $E_1 + \Delta_1$  peak in ZnSe. This was the starting point for development, with Prof. Y.C. Chang, of a hybridization model to explain the effect of magnetic ions on the band gap [1].

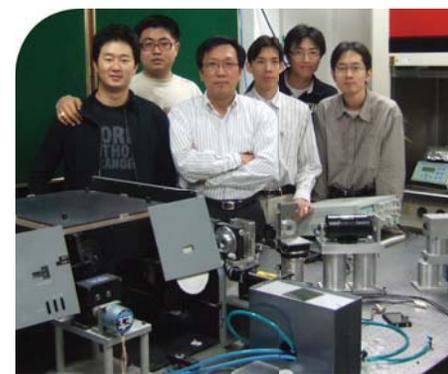
After graduation, Professor Kim returned to his native South Korea where he is now a Professor at Kyung Hee University in Seoul. His major research has dealt with band gap studies on many semiconductor films, observing higher gaps and newly identifying the band gap energies with the help of band calculations by Prof. Chang. His current interest is focused on Optical characterization of Critical Dimension (OCD). This area has seen recent widespread use during semiconductor device processing for nondestructive measurements of the geometrical shape of periodic structures. Professor Kim's group is trying to develop software tools to accommodate the speed and precision required of this measurement. Ellipsometry is then used to verify performance. His group consists of four graduate students and two post docs. Most work with ellipsometry on a regular basis while also working on theory and materials growth. They have a number of ellipsometers at their disposal, including Woollam VASE, VUV-VASE and M-2000 instruments, a Beaglehole imaging ellipsometer, and Professor Kim's home-built system.

Professor Kim's research takes him around the world to many international conferences. In 2007 alone, he traveled to Austria, Brazil, Columbia, Korea, and Sweden.

In Stockholm, Professor Kim's group attended the International Conference on Spectroscopic Ellipsometry. He enjoyed meeting old friends and broadening his perspectives on the world of ellipsometry. In addition to conferences, Professor Kim travels considerably as a member of the Korean Scientific delegation – most recently to China, Ukraine, and Vietnam. He is also serving as general secretary for the 2010 International Conference on the Physics of Semiconductors in Seoul.

Even though Professor Kim has traveled the world, his favorite location is still the Han river in Seoul where he takes evening walks with his wife. To escape from science, he spends his free time reading popular books such as “Managing in the Next Society” by Peter Drucker, “Eastward to Tartary” by Robert Kaplan, “The World is Flat” by Thomas Friedman, and many books by Richard Dawkins.

Our best wishes are extended to Professor Kim and his research group. We hope happiness and success will follow wherever life leads him.



Professor Kim with his research group and home-built ellipsometer.

The following papers provide technical information regarding Professor Kim's research.

#### References:

1. Y.D. Kim et al., “Spectroscopic ellipsometry study of the diluted magnetic semiconductor system Zn(Mn,Fe,Co)Se”, *Phys. Rev. B* **49** (1994) 1732.
2. T.J. Kim et al., “Dielectric functions of  $\text{In}_x\text{Ga}_{1-x}\text{As}$  Alloys”, *Phys. Rev. B* **68** (2003) 115323.
3. T.H. Ghong et al., “Spectroscopic ellipsometric analysis of interfaces: Comparison of alloy and effective-medium-approximation approaches to a CdMgTe multilayer system”, *Appl. Phys. Lett.* **85** (2004) 946.
4. Y.W. Jung et al., “Effect of overlayers on critical-point parameters in the analysis of ellipsometric spectra”, *Appl. Phys. Lett.* **91** (2007) 121903.