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- **Education**

- **Ph. D** in Physics, **Seoul National University**, Seoul, Korea (Aug. 1998).
Advisor: Prof. **Zheong G. Khim**.
Thesis title: "**Development and Applications of Scanning Force Microscope using Electrostatic Force Modulation**".
- **M. S.** in Physics, **Seoul National University**, Seoul, Korea(Feb. 1993).
- **B. S.** in Physics, **Korea Advanced Institute of Science and Technology** *, Taejon, Korea (Feb.1991).
- **Kyungnam High School of Science***, Chinju, Korea (Feb. 1987).
**The special education system for the gifted.*

- **Research and Teaching Careers**

- 2001 Nov.– Present: Postdoctoral Appointee, Sandia National Laboratories.
- 1998 Nov.– 2001 Oct: Research Associate I, University of Houston.
- 1998 Aug-1998. Oct.: Research Associate, Research Institute for Basic Science, Seoul National University
- 1996 Mar.-1996 Jul. : Part-time Lecturer, Ajou University, Suwon, Korea
- 1997 Jun.-1997 Jul. : ICTP, Visiting Scientist, Trieste in Italy
- 1995 Mar.-1998 Aug. : Research Assistant, Seoul National University
- 1991 Mar.-1995. Feb. : Teaching Assistant, Seoul National University

- **Professional Activities:**

- Member of the American Physical Society.
- Member of the American Vacuum Society.

- **Areas of Interest**

Manipulation and detection of biomolecular materials, Nanoscale electromechanical device for biological applications, Design and fabrication of nanoscale devices using novel materials, Scanning probe microscopy/ spectroscopy, Intermolecular forces under liquid, Nanotechnology, SPM based nanolithography and nanotribology.

Research Experience

- 2001 Nov.– Present: Post-doctoral Research at **Sandia National Laboratories** with Dr. Bruce C. Bunker and Dr. Jack E. Houston
 - IFM on Switchable Bioactive Surfaces by Photo- and Thermal activation.
 - IFM on Interfacial Tribological Properties of SAM Surfaces for MEMS Coatings.

- 1998 Nov.– 2001 Oct: Post-doctoral Research at **University of Houston** with Prof. Scott S. Perry.
 - UHV STM on Novel Self-assembled Organic Structures with the Competitive Roles of Intermolecular and Adsorbate-Substrate Interactions.
 - UHV AFM on Interfacial Frictional Properties of Metal Carbide Through Chemical Modification.
 - Phase Coherent Effect of UHV Noncontact Mode AFM with Phase Locked Oscillator.

- 1993 Mar.- 1998. Aug.: Ph. D Thesis Research at **Seoul National University** with Prof. Zheong G. Khim
 - Magnetic Force Microscopy Utilizing the Capacitance Effect of Electrostatic Force Modulation.
 - Lithography by tapping mode atomic force microscope with electrostatic force modulation.
 - AFM study on Effect of $\text{Mg}(\text{OH})_2$ On $\text{YBa}_2\text{Cu}_3\text{O}_7$ thin film on MgO substrate.

- 1991 Mar.- 1993. Feb. : M. S. thesis research at **Seoul National University** with Prof. Zheong G. Khim
 - Construction of Atomic Force Microscope(Electronic Controller, Software. Design and Construction of Mechanical System)

- 1989 – 1990: Undergraduate thesis research at **Korea Advanced Institute of Science and Technology** with Prof. Hie-Tae Moon.
 - Computer Simulation of Soliton appeared in the integro-differential Korteweg-de Vries equation

• **Publications:**

1. **B.-I. Kim Tuning of Orientation and Chiral Recognition of a Single Chiral Molecule in Self-Assembly through Modulation of Anchoring Sites.** (Submitted to Physical Review Letters)
2. **B.-I. Kim A Simple Phase Locked Oscillator For Noncontact Atomic Force Microscopy Under Ultrahigh Vacuum** (Submitted to Review of Scientific Instruments)
3. B. C. Bunker, **B. I. Kim**, J. E. Houston, S. T. Picraux, R. Rosario, A. A. Garcia, M. Hayes, and D. Gust **Observations of Photo-Switching in Tethered Spiropyrans Using the Interfacial Force Microscope** Nano Letters **3**, 1723(2003).
4. B. C. Bunker, D. L. Huber, R. P. Manginell, **B. -I. Kim**, A. K. Boal, G. D. Bachand, S. B. Rivera, J. M. Bauer, C. M. Matzke **Incorporation of Bioactive Materials into Integrated Systems** Proc. SPIE **5220** 28(2003).
5. D. L. Huber, R. P. Maginell, M. A. Samara, **B. -I. Kim**, and B. C. Bunker, **Programmed Adsorption and Release of Proteins in a Microfluidic Device**, Science **301**, 352(2003).
6. **B.-I. Kim**, C. Cai, X. Deng, S. S. Perry. **Adsorption-induced chirality influences surface orientation in organic self-assembled structures: an STM study of PVBA on Pd(111).** Surf. Sci. **538**, 45(2003).
7. L. C. Fernandez-Torres, **B. -I. Kim**, S. S. Perry **The frictional response of VC(100) surfaces: Influence of 1-octanol and 2,2,2-trifluoroethanol adsorption** Tribology Letters **15**, 43(2003).
8. X. Chen, S. Wang, Y. L. Yang, L. Smith, N. J. Wu, **B. I. Kim**, S. S. Perry; A. J. Jacobson, A. Ignatiev, **Electrical conductivity relaxation studies of an epitaxial $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$ thin film** Solid State Ionics **146**, 405(2002).
9. R. L. Guenard, L. C. Fernandez-Torres, **B. -I. Kim**, S.S. Perry, P. Frantz, S. V. Didziulis, **Selective surface reactions of single crystal metal carbides: alkene production from short chain alcohols on titanium carbide and vanadium carbide** Surf. Sci. **515**, 103(2002)
10. **B. I. Kim**, S. Lee, R. L. Guenard, L. C. Fernandez-Torres, S. S. Perry P. Frantz and S. V. Didziulis, **"Chemical Modification of the Interfacial Frictional Properties of Vanadium Carbide Through Ethanol Adsorption"**, Surf. Sci.(2001) **481**, 185(2001).
11. C. A. Mims, N. I. Joos, P. A.W. van der Heide, A. J. Jacobson, C. Chen, C. W. Chu, **B. I. Kim**, S. S. Perry, **"Oxygen transport in oxide thin film structures oriented $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-x}$ on single-crystal yttria-stabilized zirconia"**, Electrochemical and Solid State Letters **3**, 59(2000).
12. H. Lee, S. M. Lee, E. T. Ada, **B. Kim**, M. Weiss, S. S. Perry, J. W. Rabalais, **"Shallow implantation of Ti^+ ions in sapphire [$\text{a} -\text{Al}_2\text{O}_3(0001)$]"**, Nucl. Instrum. Meth. B **157**, 226(1999).

13. B. I. Kim, U. H. Pi, S. Yoon and Z. G. Khim, " **Lithography by tapping mode atomic force microscope with electrostatic force modulation**", Appl. Phys. A **66**, s95(1998).
14. B. I. Kim, J. W. Hong, J. I. Kye, Z. G. Khim and S. Yoon, " **Construction of Magnetic Force Microscope and its Application to Magnetic Multilayer Films**" J. Kor. Phys. Soc. **31**, S79 (1997).
15. J. W. Hong, B. I. Kim, J. I. Kye and Z.G. Khim, " **Effect of electrostatic force and tapping mode operation of atomic force microscope**" J. Kor. Phys. Soc. **31**, S83 (1997).
16. J. I. Kye, W. K. Park, B. I. Kim, Z. G. Khim, G. T. Jeong, D. H. Lee, T. E. Shim, and J. G. Lee, " **Single Electron Tunneling Effect in YBCO Film**", J. Kor. Phys. Soc. **29**, 354(1996).
17. B. I. Kim, J. W. Hong, G. T. Jeong, S. H. Moon, D. H. Lee, T. U. Shim and Z. G. Khim, " **Effect of Mg(OH)₂ On YBa₂Cu₃O₇ thin film on MgO substrate studied by Atomic Force Microscope**", J. Vac. Sci. Technol. **B12(3)**, 1631(1994).
18. W. Jo, H-J. Cho, T. W. Noh, B. I. Kim, D_Y. Kim, Z. G. Khim, and S-I. Kwun, " **Structural and electro-optic properties of pulsed laser deposited Bi₄Ti₃O₁₂ thin films on MgO**", Appl. Phys. Lett. **63**, 2199(1993).

- **Recent Presentations**

1. Byung-Il Kim, Thomas M. Mayer, Matthew G. Hankins, Maarten P. DeBoer, Bruce C. Bunker, " **Degradation of Self-Assembled Monolayer in Humid Environments**", AVS 50th International Symposium, Baltimore, MD, Nov 2-7, 2003.
2. Byung-Il Kim, B. C. Bunker, D. L. Huber, J. E. Houston, S. T. Picraux, R. Rosario, A. A. Garcia, M. Hayes, And D. Gust, " **Surface Forces on Switchable Bioactive Surfaces Studied by Interfacial Force Microscope**", 39th Symposium of the AVS New Mexico Chapter, Albuquerque, NM, April 29-30, 2003
3. Byung-Il Kim, Thomas M. Mayer, Matthew G. Hankins, Maarten P. DeBoer, Bruce C. Bunker, " **Self-Assembled Monolayer Aging in Humid Environments**", APS March 2003 Meeting, Austin, TX, March 3-7, 2003.
4. B. -I. Kim, M. A. Samara, D. L. Huber, J. E. Houston and B. C. Bunker " **Hydration Forces on a Switchable Bioactive Surface**", AVS 49th International Symposium, Denver, CO, Nov 3-8, 2002.
5. B.-I. Kim, X. Deng, C. Cai, S. S. Perry, " **Organic Molecular Beam Epitaxy of Self-assembling Structures on PD(111)**", APS March 2001 Meeting, Seattle, Washington, March 12-16, 2001.

References

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