

## Personal Information

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First name / Surname: Sung Jin Kang

Affiliation: Center for Correlated Electron Systems, Institute for Basic Science (IBS), Seoul 151-747, Republic of Korea

Current position: Postdoctoral fellow (advisor: Prof. Tae-Won Noh)

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Nationality: Republic of Korea

Date of Birth: Aug. 21. 1984 / Gender: Male

## Experience / Education

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| <b>Mar. 2004 - Aug. 2008</b> | B.S. at Department of Materials Science and Engineering, College of Engineering, Seoul National University  |
| <b>Sep. 2008 - Sep. 2013</b> | M.S. & Ph. D. at Department of Materials Science and Engineering, College of Engineering, Seoul National University (advisor: Prof. Mi-Young Kim)<br><br>Thesis title: Study of the Various Phases in Light Weight Alloys using Transmission Electron Microscopy and Ab-initio Calculations |
| <b>Sep. 2011 - Sep. 2012</b> | Visitor at University of Illinois Urbana Champaign (UIUC) (advisor: Prof. Jian-Min Zuo)   |
| <b>Oct. 2013 – present</b>   | Postdoctoral research fellow at Center for Correlated Electron Systems, Institute for Basic Science (IBS) (advisor: Prof. Tae Won Noh)  |

## Scholarships and Awards

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- Mar. 2004 - Feb. 2008** National Natural Science and Engineering Scholarship from Korean Student Aid Foundation (KOSAF)
- Sep. 2011 - Sep. 2012** National Research Foundation: Brain Korea 21 Graduate Student Fellowship
- Feb. 2013** Human Tech Samsung award (Silver medal winner)

## Research Experience

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### ◆ Preparation of materials

- Preparing alloys from pure elements
- Preparing TEM specimen from metal, thin film substrate, nano-particle and rod

### ◆ Characterization

- Aberration Corrected Scanning Transmission Electron Microscopy (ac-STEM), Electron Energy Loss Spectroscopy (EELS), Electron Diffraction, Energy Dispersive X-ray (EDX) Spectroscopy analysis

### ◆ Computer programing and Simulation

- Programming experience: C, Python, Mathlab, Fortran, Linux shell scripting
- Image simulation, Gatan Digital Micrograph (DM) scripting

### ◆ Density Functional Theory calculation and Atomic modeling

- Estimation of Band Structure, Density of State, Formation energy, Mechanical property
- Developing atomic structure model from ac-STEM images and Spectroscopy information

## Publications

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1. **S. J. Kang**, J. M. Zuo and M. Kim\*, "Growth mechanism of Omega precipitate in Al-Cu-Mg-Ag alloy: Ab-initio study," Preparing for the submission.
2. **S. J. Kang**, J. I. Lee, E. S. Park and M. Kim\*, "Determination of atomic structure of T<sub>1</sub> precipitate structure in Al-Li-Cu-Mg-Ag alloy," Preparing for the submission.
3. S. H. Oh, H. J. Jin, H. Y. Shin, S. H. Yoon, J. S. Ahn, J. H. Cha, S. L. Hong, **S. J. Kang**, M. Kim and W. Jo\*, "Elongated epitaxy of PbVO<sub>3</sub> thin films: impact of composition and lattice-matching on strain development and crystal growth," Preparing for the submission.
4. B. Moon, **S. J. Kang**, M. Kim and J. S. Kim\*, "Nano-patterning of Si(100) with Au Co-deposition during Ion-beam sputtering," Preparing for the submission.
5. D. Kwon, S. B. Lee, C. S. Kang, Y. S. Choi, **S. J. Kang**, H. L. Cho, W. B. Shon, S. M. Yoon, K. H. Oh, T. W. Noh and M. Kim\*, "Formation of nano-filaments in STO thin film," Preparing for the submission.
6. M. S. Anwar\*, Y. J. Shin, S. R. Lee, **S. J. Kang**, Y. Sugimoto, S. Yonezawa, T. W. Noh and Y. Maeno, "Ferromagnetic SrRuO<sub>3</sub> thin-film deposition on a spin-triplet superconductor Sr<sub>2</sub>RuO<sub>4</sub> with highly conducting interface," *Applied Physics Express*, 8, pp. 015502, Dec. 2014.
7. G. S. Park\*, S. Y. Park, S. Heo, O. Kwon, K. Cho, K. Y. Han, **S. J. Kang**, A. Yoon and M. Kim\*, "Origin of leakage paths driven by electric fields in Al-doped TiO<sub>2</sub> films," *Advanced materials*, DOI: 10.1002/adma.201403647, Nov. 2014.
8. S. H. Kim, **S. J. Kang**\*, M. H. Park, C. W. Yang, H. N. Han\* and M. Kim, "Vacancy-mediated  $\omega$ -assisted  $\alpha$  phase formation mechanism in titanium-molybdenum alloy," *Acta Materialia*, 83, pp. 499-506, Oct. 2014.
9. O. T. Tambunan, K. J. Pawanta, S. K. Acharya, B. W. Lee, Y. S. Kim, B. H. Park, H. Jeoung, J. Y. Park, M. R. Cho, Y. D. Park, W. S. Choi, D. W. Kim, H. Jin, S. Lee, S. J. Song, **S. J. Kang**, M. Kim, C. S. Hwang and C. U. Jung\*, "Resistance switching in epitaxial SrCoOx thin films," *Applied physics letters*, vol. 105, No. 4, pp. 063507, Aug. 2014.
10. **S. J. Kang**, Y. W. Kim, M. Kim and J. M. Zuo\*, "Determination of interfacial atomic structure, misfits and energetics of Omega phase in Al-Cu-Mg-Ag alloy," *Acta Materialia*, 81, pp. 501-511, Jul. 2014.
11. **S. J. Kang**, Y. W. Kim, M. Kim and J. M. Zuo\*, "Interfacial microscopic mechanism of free energy minimization in Omega precipitate formation", arXiv.org, vol. 583, Jan. 2014.
12. **S. J. Kang**, S. P. Park, M. Kim, H. N. Han, S. K. Lee, K. Y. Lee and Y. K. Kwon\*, "Enhanced mechanical property of Fe-Al alloy due to Mn insertion: ab initio study," *Journal of Alloys and Compounds*, vol. 583, pp. 295-299, Jan. 2014.
13. A. R. Jeong, W. Jo\*, C. Ko, M. Han, **S. J. Kang**, M. Kim, D. Y. Park, H. Cheong and H. J. Yun, "Growth and structural properties of pulsed laser-ablated CuInSe<sub>2</sub> nanoparticles by pulsed-laser ablation and selenization process," *Journal of Alloys and Compounds*, vol. 509, pp. 8073-8076, 2011.

14. S. H. Jang, Y. D. Ko, **S. J. Kang**, D. W. Kim, J. S. Chung, M. Kim, M. S. Han and E. J. Choi\*, "Photoluminescence induced by thermal annealing in SrTiO<sub>3</sub> thin film," *Applied physics letters*, vol. 95, pp. 241906, 2009.

## Presentations

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### International conference

1. "Investigation of T<sub>1</sub> precipitate structure in Al-5.1Li-1.9Cu-0.28Mg-0.2Ag alloy", **S. J. Kang**, J. I. Lee, E. S. Park, T. W. Noh and M. Kim, 2014 AsiaNANO, Oct. 26-29, 2014, Jeju, Korea.
2. "Studying Omega to Alpha phase transformation in Ti-15Mo alloy by combination of aberration-corrected scanning transmission electron microscopy and ab-initio calculations", **S. J. Kang**, S. H. Kim, M. H. Park, C. W. Yang, H. N. Han, H. C. Lee, Y. U. Heo and M. Kim, IMC 2014, Sep. 7-12, 2014 Prague, Czech Republic.
3. "Atomistic study of martensitic transformation on Omega to Alpha phase transformation in Ti-Mo alloy", **S. J. Kang**, S. H. Kim, M. H. Park, C. W. Yang, H. N. Han and M. Kim, EMRS 2014, May 27-29, 2014, Lille, France.
4. "Solving complex interfacial structure of nanometer-sized Omega precipitates in Alpha Al", **S. J. Kang**, Y. W. Kim, M. Kim and J. M. Zuo, 2013 EAMC-1, Aug. 1-6, 2013, Chongqing, China.
5. "Structure determination of Al-Cu-Mg-Ag Omega precipitate by electron diffraction technique", **S. J. Kang**, Y. W. Kim, M. Kim and J. M. Zuo, 2012 APMC 10, Feb. 20-25, 2012, Perth, Australia.
6. "Toward high-performance iron based alloys", **S. J. Kang**, M. Kim and Y. K. Kwon, 2011 HMnS Meeting, May 15-18, 2011, Seoul, Korea.
7. "TEM study of strain-induced transformation of metastable austenite", **S. J. Kang**, T. H. Ahn, M. Kim and H. N. Han, IMC17 2010, Sep. 19-24, 2010, Rio de Janeiro, Brazil.
8. "Characteristic picture of Fe-Based disordered alloys: Ab-initio study", **S. J. Kang**, M. Kim and Y. K. Kwon, 2010 APS March Meeting, March 15-19, 2010, Portland, Oregon, USA.

### National conference

9. "Study of interface structure of nanometer sized omega precipitates", **S. J. Kang**, Y. W. Kim, M. Kim and J. M. Zuo, The Korean Institute of Metals and Materials, April 25-26, 2013, Jeju, Korea.
10. "Toward high-performance iron based alloys: Ab-initio study", **S. J. Kang**, M. Kim and Y. K. Kwon, Korean Vacuum Society, Feb. , 2010, Gangwon-do, Korea.