

## BIOGRAPHICAL SKETCH: Sang Eon Han (updated 2/17/2017)

### Education and Training

Seoul National University	Chemical Engineering	B.S., 1996
Seoul National University	Chemical Engineering	M.S., 1998
University of Minnesota	Chemical Engineering	Ph.D., 2009
Massachusetts Institute of Technology	Mechanical Engineering	Postdoc, 2009-2012

### Research and Professional Experience

Assistant Professor, Department of Chemical and Biological Engineering, University of New Mexico, Albuquerque, NM, USA, 2012-present.

Research Scientist, LG Chem. Research Park, Daejeon, Korea, 1998-2003.

### Honors and Awards

2016,2017	STC Innovation Award
2016	NSF CAREER Award
2013	Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Award
2007	DoWonSuk Memorial Award
2003-2007	Fellowship from the Samsung Lee Kun Hee Scholarship Foundation
2001	Industrial Innovation Award from Korea Ministry of Commerce, Industry, and Energy
2001	LG R&D Award
2001	LG Chem R&D Award

### Selected Publications

- S. Ghosh, B. R. Hoard, E. C. Culler, S. M. Han, and **S. E. Han**, "Symmetry-breaking nanostructures on crystalline silicon for enhanced light-trapping in thin film solar cells," *Opt. Express* **24**, A1586-A1596 (2016).
- D. Lee and **S. E. Han**, "Chiral nanocomposites: Hand-twisting light," *Nature Mater.* **15**, 377-378 (2016).
- J. H. Park, **S. E. Han**, P. Nagpal, and D. J. Norris, "Observation of thermal beaming from tungsten and molybdenum bull's eyes," *ACS Photon.* **3**, 494-500 (2016).
- M. S. Branham, W.-C. Hsu, S. Yerci, J. Loomis, S. V. Boriskina, B. R. Hoard, **S. E. Han**, A. Ebong, and G. Chen, "Empirical comparison of random and periodic surface light-trapping structures for ultrathin silicon photovoltaics," *Adv. Opt. Mater.* **4**, 858-863 (2016).
- **S. E. Han**, "Suppression of infrared absorption in nanostructured metals by controlling Faraday inductance and electron path length," *Opt. Express* **24**, 2577 (2016).
- M. S. Branham, W.-C. Hsu, S. Yerci, J. Loomis, S. V. Boriskina, B. R. Hoard, **S. E. Han**, and G. Chen, "15.7% efficient 10- $\mu$ m-thick silicon photovoltaics using periodic nanostructures," *Adv. Mater.* **27**, 2182 (2015).
- T. Cai and **S. E. Han**, "Effect of symmetry in periodic nanostructures on light trapping in thin film solar cells," *J. Opt. Soc. Am. B* **32**, 2264 (2015).
- **S. E. Han** and S. M. Clark, "Optical properties of metamaterial serpentine metal electrodes," *AIP Advances* **4**, 123002 (2014).
- S. M. Clark and **S. E. Han**, "Two-dimensional metamaterial transparent metal electrodes for infrared optoelectronics," *Opt. Lett.* **39**, 3666 (2014).
- J. K. Tong, W.-C. Hsu, **S. E. Han**, B. R. Burg, R. Zheng, S. Shen, and G. Chen, "Direct and quantitative photothermal absorption spectroscopy of individual particulates," *Appl. Phys. Lett.*

[103, 261104 \(2013\).](#)

- A. Mavrokefalos, **S. E. Han**, S. Yerci, M. S. Branham, and G. Chen, “Efficient light-trapping in inverted nano-pyramid thin crystalline silicon membranes for solar cell applications,” [Nano Lett. 12, 2792 \(2012\).](#)
- **S. E. Han** and G. Chen, “Toward the Lambertian limit of light trapping in thin nanostructured silicon solar cells,” [Nano Lett. 10, 4692 \(2010\).](#)
- **S. E. Han** and G. Chen, “Optical absorption enhancement in silicon nanohole arrays for solar photovoltaics,” [Nano Lett. 10, 1012 \(2010\).](#)
- **S. E. Han** and D. J. Norris, “Beaming thermal emission from hot metallic bull’s eyes,” [Opt. Express 18, 4829 \(2010\).](#)
- **S. E. Han** and D. J. Norris, “Control of thermal emission by selective heating of periodic structures,” [Phys. Rev. Lett. 104, 043901 \(2010\).](#)
- **S. E. Han**, “Theory of thermal emission from periodic structures,” [Phys. Rev. B 80, 155108 \(2009\).](#)
- P. Nagpal, **S. E. Han**, A. Stein, and D. J. Norris, “Efficient low-temperature thermophotovoltaic emitters from metallic photonic crystals,” [Nano Lett. 8, 3238 \(2008\).](#)
- **S. E. Han**, A. Stein, and D. J. Norris, “Tailoring self-assembled metallic photonic crystals for modified thermal emission,” [Phys. Rev. Lett. 99, 053906 \(2007\).](#)  
[Selected for *Virtual Journal of Nanoscale Science & Technology* **16**, Issue 7, August 13 (2007)]

### **Synergistic Activities**

- Chair, AIChE Photonic and Electronic Materials sessions (2014-2016)
- 17 invited seminars/talks and 26 contributed presentations at national/international universities and conferences
- Advisor of 12 undergraduate students for research. Mentor of 2 elementary school teachers for research
- Referee for Nano Letters, Physical Review X, Journal of the American Chemical Society, Scientific Reports, Optics Express, ACS Applied Materials & Interfaces, Applied Physics Letters, Journal of Heat Transfer, Journal of Heat and Mass Transfer, Photonics, AIMS’s Journal, Proceedings of ASME.

### **Collaborators**

Sang M. Han (University of New Mexico), John K. Grey (University of New Mexico), Steve R. J. Brueck (University of New Mexico), Sanjay Krishna (University of New Mexico), Anastassios Mavrokefalos (University of Huston), Daeyeon Lee (University of Pennsylvania).

### **Graduate and Postdoctoral Advisors**

Prof. David J. Norris (ETH Zürich, PhD Advisor), Prof. Gang Chen (Massachusetts Institute of Technology, Postdoc Advisor), Prof. C. Daniel Frisbie (University of Minnesota, Thesis Committee), Prof. Eray S. Aydil (University of Minnesota, Thesis Committee), Prof. Boris I. Shklovskii (University of Minnesota, Thesis Committee)

### **Thesis Advisee and Postgraduate-Scholars Supervised**

Andrew Cochrane (2012-2013, MS graduated), Brittany R. Hoard (2013-2014, MS graduated), Samuel M. Clark (2013-2014, MS graduated), Sarun Atygianun (2013-present), Seok Jun Han (2014-present), Mi Zhou (2014-2015, Advisor S. M. Han), Nicholas Brechtel (2015-2016, MS graduated, Advisor S. M. Han), Vineeth Sasidharan (2016-present, Advisor S.R.J. Brueck), John Plumley (2016-present, Postdoc).