백 승 협 Seung-Hyub Baek, Ph.D.

직장 주소: 서울 성북구 화랑로 14 길 5 한국과학기술연구원 L6320 02792
자택주소:서울 성북구 삼선교로 16 길 35 삼선 SKVIEW 아파트 103-1003
계좌번호: 우리은행, 1002-145-650132
Tel: 82-2-958-5382 /82-10-2107-7980
shbaek77@kist.re.kr

EDUCATION

Associate Professor	Nanomaterials Science & Technology	University of Science and Technology (UST)	03/2012~present
Senior Researcher	Electronic Materials Research Center	Korea Institute of Science and Technology (KIST)	12/2011~present
Research Associate	Materials Science & Engineering	University of Wisconsin – Madison (Advisor: Chang-Beom Eom, Ph.D.)	09/2010~11/2011
Ph. D.	Materials Science & Engineering	University of Wisconsin – Madison (Advisor: Chang-Beom Eom, Ph.D.)	06/2007~08/2010
M.S.	Materials Science & Engineering	University of Wisconsin – Madison (Advisor: Chang-Beom Eom, Ph.D.)	09/2004~05/2007
B.S.	Materials Science & Engineering	Seoul National University	03/1997~02/2004

RESEARCH INTERESTS

- Multifunctional epitaxial oxide thin films
  - Epitaxial oxide on Si
  - P-MUT (Piezoelectric Micromachined Ultrasonic Transducer)
  - Piezoelectric energy harvesting
  - Two dimensional electron gas at oxide interfaces
  - Multiferroics for magnetoelectric devices
  - Ferroelectrics for non-volatile modulation
- Thermoelectrics
  - Bismuth telluride alloy synthesis
  - Thermoelectric modules for wearable device
  - Spin-Seebeck effect
- Post-Si semiconductors
  - Wide bandgap oxide semiconductor for power devices
  - Oxynitride, Oxychalcogenide

AWARDS AND HONORS

- KIST Young Fellow (2018)
- KIST Excellent Research Team (2018)
- Outstanding Professor of UST (2017)
- KIST Researcher of the Month (2016, October)

- KRCF (Korea Research Council of Fundamental Science and Technology) Outstanding Young Researcher (2013)
- KIST Excellent Research Team (2012)
- MRS Graduate Student Award, Silver (2010 Fall).
- David Turnbull Graduate Student Award at UW-Madison (2010).
- Travel Fellowship for Nanoferroelectrics summer school in China (2009).
- Full scholarship supported by Korea Research Foundation (2004-2005).
- Full scholarship supported by Dong-Bu Steel Foundation (2002-2003).
- Citation for High Achievement of Private First Class from brigadier general (1999).

PUBLICATIONS (H-INDEX: 33, CITATION: 5,079 BY WEB-OF-SCIENCE)

1. Myoung-Sub Noh, Hyunseok Lee, Young Geun Song, Inki Jung, Ruiguang Ning, Sung Wook Paek, Hyun-Cheol Song, **Seung-Hyub Baek**, Chong-Yun Kang*, Sangtae Kim* Li Alloy-based Non-Volatile Actuators. ***Nano Energy*** 57, 653 (2019)
2. Mi-Jin Jin, Daeseong Choe, Seung Youb Lee, Jungmin Park, Junhyeon Jo, Inseon Oh, Shin-Ik Kim, **Seung-Hyub Baek**, Cheolho Jeon, Jung-Woo Yoo, Probing surface electronic properties of a patterned conductive STO by reactive ion etching. ***Appl. Surf. Sci.*** 466, 730 (2019)
3. Sangtae Kim*, Hyo Jin Gwon, Sung Wook Paek, Seong Keun Kim, Ji-Won Choi, Jin-Sang Kim, Jung-Hae Choi, Chong-Yun Kang* & **Seung-Hyub Baek*** ***Sci. Rep***. 8, 14471 (2018)
4. Jung Joon Pyeon, In-Hwan Baek, Weon Cheol Lim, Keun Hwa Chae, Seong Ho Han, Ga Yeon Lee, **Seung-Hyub Baek**, Jin-Sang Kim, Ji-Won Choi, Taek-Mo Chung, Jeong Hwan Han, Chong-Yun Kang, Seong Keun Kim* Low-temperature wafer-scale synthesis of two-dimensional SnS2. ***Nanoscale*** 10, 17712 (2018)
5. Taeyueb Kim, Shin-Ik Kim, Sungjung Joo, Sangsu Kim, Jeehoon Jeon, Jinki Hong, Yong-Joo Doh, **Seung-Hyub Baek**, Hyun Cheol Koo, A possible superconductor-like state at elevated temperatures near metal electrodes in an LaAlO3/SrTiO3 interface. ***Sci. Rep***. 8, 11558 (2018)
6. Myoung-Sub Noh, Soo Deok Han, Songhwa Chae, Seung Hyuk Back, Sangtae Kim, **Seung-Hyub Baek**, Seong Keun Kim, Ji-Won Choi, Jin-Sang Kim, Dong June Ahn, Dukhyun Choi*, Chong-Yun Kang* Laser-irradiated inclined metal nanocolumns for selective, scalable, and room-temperature synthesis of plasmonic isotropic nanospheres. ***J. of Mater. Chem. C*** 6, 6038 (2018)
7. Bongki Min, Sang-Soon Lim, Sung-Jin Jung, Gareoung Kim, Byeong-Hyeon Lee, Sung Ok Won, Seong Keun Kim, Jong-Soo Rhyee , Jin-Sang Kim,* **Seung-Hyub Baek*** Texture-induced reduction in electrical resistivity of p-type (Bi,Sb)2Te3 by a hot extrusion. ***J. Alloys Compd.*** 764, 261 (2018)
8. Sung-Jin Jung, Byeong-Hyeon Lee, Byung Kyu Kim, Sang-Soon Lim, Seong Keun Kim, Dong-Ik Kim, Sung Ok Won, Hyung-Ho Park, Jin-Sang Kim*, **Seung-Hyub Baek***, Impurity-free, mechanical doping for the reproducible fabrication of the reliable n-type Bi2Te3-based thermoelectric alloys. ***Acta Materialia*** 150, 153 (2018)

9. Hi Gyu Moon, Youngmo Jung, Soo Deok Hana, Young-Seok Shima, Woo-Suk Jung, Taikjin Lee, Seok Lee, Jung Han Park, **Seung-Hyub Baek**, Jin-Sang Kim, Hyung-Ho Park, Chulki Kim, Chong-Yun Kang, All villi-like metal oxide nanostructures-based chemiresistiveelectronic nose for an exhaled breath analyzer. ***Sensors and Actuators B*** 257, 295–302 (2018)

10. Yun Li, Euiyoung Choi, Shin-Ik Kim, **Seung-Hyub Baek**, Seung-Young Park, Younghun Jo, and Jiwon Seo, Origin of insulating weak-ferromagnetic phase in ultra-thin La0.67Sr0.33MnO3 films on SrTiO3 substrate. ***AIP Advances*** 7, 085224 (2017)

11. Sang-Soon Lim, Byung Kyu Kim, Seong Keun Kim, Hyung-Ho Park, Dong-Ik Kim, Dow-Bin Hyun, Jin-Sang Kim*, **Seung-Hyub Baek***, A two-step synthesis process of thermoelectric alloys for the separate control of carrier density and mobility. ***J. Alloys Compd.*** 727, 191 (2017).

12. In-Hwan Baek, Jung Joon Pyeon, Young Geun Song, Taek-Mo Chung, Hae-Ryoung Kim, **Seung-Hyub Baek**, Jin-Sang Kim, Chong-Yun Kang, Ji-Won Choi, Cheol Seong Hwang, Jeong Hwan Han, Seong Keun Kim*, Synthesis of SnS Thin Films by Atomic Layer Deposition at Low Temperatures. ***Chem. Mater.*** 29, 8100 (2017).

13. Gwangyeob Lee, Seon Young Moon, Jinyeon Kim, **Seung-Hyub Baek**, Do Hyang Kim, Ho Won Jang and Hye Jung Chang, Electron beam induced epitaxial crystallization in a conducting and insulating a-LaAlO3/SrTiO3 system. ***RSC Adv.*** 7, 40279 (2017).

14. Min-Sun Jang, Im-Jun Roh, Jungmin Park, Chong-Yun Kang, Won Jun Choi, **Seung-Hyub Baek**, Sung Soo Park, Jung-Woo Yoo, Ki-Suk Lee, Dramatic enhancement of the saturation magnetization of a sol-gel synthesized Y3Fe5O12 by a mechanical pressing process. ***J. Alloys Compd***. 711, 693 (2017).

15. Hye Jin Lee, Dae-Han Jung, Tae-Hyeon Kil, Sang Hyeon Kim, Ki-Suk Lee, **Seung-Hyub Baek**, Won Jun Choi,* and Jeong Min Baik*, Mechanically Robust, Stretchable Solar Absorbers with Submicron-Thick Multilayer Sheets for Wearable and Energy Applications. ***ACS Appl. Mater. Interfaces*** 2017, 9, 18061−18068

16. Tae-Hyeon Kil, Sanghyeon Kim, Dae-Han Jeong, Dae-Myeong Geum, Sooseok Lee, Sung-Jin Jung, Sangtae Kim, Chan Park, Jin-Sang Kim, Jeong Min Baik, Ki-Suk Lee, Chang Zoo Kim, Won Jun Choi*, **Seung-Hyub Baek***, A highly-efficient, concentrating-photovoltaic/thermoelectric hybrid generator. ***Nano Energy*** 37, 242 (2017).

17. Yun Goo Lee, Junsoo Kim, Min-Su Kang, **Seung-Hyub Baek**, Seong Kuen Kim, Seung-Min Lee, Jaewoo Lee, Dow-Bin Hyun, Byeong-Kwon Ju, Seung Eon Moon, Jin-Sang Kim,* and Beomjin Kwon*, Design and Experimental Investigation of Thermoelectric Generators for Wearable Applications. ***Adv. Mater. Technol.*** 1600292 (2017).

18. **Seung-Hyub Baek**, Seokhoon Choi, Taemin Ludvic Kim, Ho Won Jang*, Domain engineering in BiFeO3 thin films. ***Current Applied Physics*** 17, 688 (2017).

19. Soo Hyun Kim, In-Hwan Baek, Da Hye Kim, Jung Joon Pyeon, Taek-Mo Chung, **Seung-Hyub Baek**, Jin-Sang Kim, Jeong Hwan Han* and Seong Keun Kim*, Fabrication of high-performance p-type thin film transistors using atomic-layer-deposited SnO films. ***J. Mater. Chem. C*** 5, 3139 (2017).

20. Cheol Jin Cho, Jun-Yun Kang, Woo Chul Lee, **Seung-Hyub Baek**, Jin-Sang Kim, Cheol Seong Hwang,* and Seong Keun Kim*, Interface Engineering for Extremely Large Grains in Explosively Crystallized TiO2 Films Grown by Low-Temperature Atomic Layer Deposition. ***Chem. Mater***. 29, 2046 (2017).

21. Mi-Jin Jin, Seon Young Moon, Jungmin Park, Vijayakumar Modepalli, Junhyeon Jo, Shin-Ik Kim, Hyun Cheol Koo, Byoung-Chul Min, Hyun-Woo Lee, **Seung-Hyub Baek**, and Jung-Woo Yoo, Nonlocal Spin Diffusion Driven by Giant Spin Hall Effect at Oxide Heterointerfaces. ***Nano Lett*.** 28, 7051 (2017)

22. Im-Jun Roh, Yun Goo Lee, Min-Su Kang, Jae-Uk Lee, **Seung-Hyub Baek**, Seong Keun Kim, Byeong-Kwon Ju, Dow-Bin Hyun, Jin-Sang Kim & Beomjin Kwon, Harman Measurements for Thermoelectric Materials and Modules under Non-Adiabatic Conditions. ***Sci. Rep.*** 6, 39131 (2016)

23. Hyunwoo Jin, Keundong Lee, **Seung-Hyub Baek**, Jin-Sang Kim, Byung-ki Cheong, Bae Ho Park, Sungwon Yoon, B. J. Suh, Changyoung Kim, S. S. A. Seo & Suyoun Lee, Large linear magnetoresistance in heavily-doped Nb:SrTiO3 epitaxial thin films. ***Sci. Rep.*** 6, 34295 (2016)

24. Hyo Jin Gwon, Na-Ri Kang, Yunju Lee, Sung Ok Won, Hye Jung Chang, Ji-Won Choi, Chong-Yun Kang, Seong Keun Kim, Beomjin Kwon, Sahn Nahm, Ju-Young Kim, Jin-Sang Kim, and **Seung-Hyub Baek*,** Enhancement of Mechanical Hardness in SnOxNy with a Dense High-Pressure Cubic Phase of SnO2. ***Chem. Mater***. 28, 7051 (2016).

25. Kwang-Chon Kim, Joohwi Lee, Byung Kyu Kim, Won Young Choi, Hye Jung Chang, Sung Ok Won, Beomjin Kwon, Seong Keun Kim, Dow-Bin Hyun, Hyun Jae Kim, Hyun Cheol Koo, Jung-Hae Choi, Dong-Ik Kim, Jin-Sang Kim* & **Seung-Hyub Baek***, Free-electron creation at the 60° twin boundary in Bi2Te3. ***Nature Commun.*** 7, 12449 (2016)

26. Seon Young Moon, Cheon Woo Moon, Hye Jung Chang, Taemin Kim, Chong‑Yun Kang, Heon‑Jin Choi, Jin‑Sang Kim, **Seung‑Hyub Baek*** and Ho Won Jang*, Thermal stability of 2DEG at amorphous LaAlO3/crystalline SrTiO3 heterointerfaces. ***Nano Convergence*** 3, 7 (2016)

27. Min-Su Kang, Im-Jun Roh, Yun Goo Lee, **Seung-Hyub Baek**, Seong Keun Kim, Byeong-Kwon Ju, Dow-Bin Hyun, Jin-Sang Kim & Beomjin Kwon, Correction of the Electrical and Thermal Extrinsic Effects in Thermoelectric Measurements by the Harman Method. ***Sci. Rep.*** 6, 26507 (2016)

28. Jung Joon Pyeon, Soo Hyun Kim, Doo Seok Jeong, **Seung-Hyub Baek**, Chong-Yun Kang, Jin-Sang Kim and Seong Keun Kim, ***Nanoscale*** 8, 10792 (2016)

29. Sang-Soon Lim, Ju-Heon Kim, Beomjin Kwon, Seong Keun Kim, Hyung-Ho Park, Ki-Suk Lee, Jeong Min Baik, Won Jun Choi, Dong-Ik Kim, Dow-Bin Hyun, Jin-Sang Kim, **Seung-Hyub Baek***, Effect of spark plasma sintering conditions on the thermoelectric properties of (Bi0.25Sb0.75)2Te3 alloys. ***J. Alloys Compd.*** 678, 396 (2016)

30. Seon Young Moon, Cheon Woo Moon, Hye Jung Chang, Taemin Kim, Chong‑Yun Kang, Heon‑Jin Choi, Jin‑Sang Kim, **Seung‑Hyub Baek*** and Ho Won Jang*, Comprehensive Study on Critical Role of Surface Oxygen Vacancies for 2DEG Formation and Annihilation in LaAlO3/SrTiO3 Heterointerfaces. ***Electron. Mater. Lett.*** 12, 243 (2016)

31. Chan-Rok Park, Seon Young Moon, Da-Hee Park, Shin-Ik Kim, Seong-Keun Kim, Chong-Yun Kang, **Seung-Hyub Baek**, Jung-Hae Choi, Jin-Sang Kim, Eunsoo Choi, Jin-Ha Hwang, Impedance-based

interpretations in 2-dimensional electron gas conduction formed in the LaAlO3/SrxCa1-xTiO3/SrTiO3 system. ***J. Phys. Chem. Solids*** 93, 131 (2016)

32. Woo-SukJung, Min Jae Lee, **Seung-Hyub Baek**, In Ki Jung, Seok-Jin Yoon, Chong-Yun Kang, Structural approaches for enhancing output power of piezoelectric polyvinylidene fluoride generator. ***Nano Energy*** 22, 514 (2016)

33. Im-Jun Roh, Beomjin Kwon, **Seung-Hyub Baek**, Seong Keun Kim, Jin-Sang Kim, and Chong-Yun Kang, Thickness-Dependent Electrocaloric Effect in Pb0.9La0.1Zr0.65Ti0.35O3 Films Grown by Sol-Gel Process. ***J. Electron. Mater.*** 45, 4057 (2016)

34. Soo Hyun Kim, Jung Joon Pyeon, Woo Chul Lee, Doo Seok Jeong, **Seung-Hyub Baek**, Jin-Sang Kim, and Seong Keun Kim*, Growth Enhancement and Nitrogen Loss in ZnOxNy Low-Temperature Atomic Layer Deposition with NH3. ***J. Phys. Chem. C*** 119, 23470 (2015)

35. Jung Joon Pyeon, Jun-Yun Kang, **Seung-Hyub Baek**, Chong-Yun Kang, Jin-Sang Kim, Doo Seok Jeong, and Seong Keun Kim*, Orientation-Controlled Growth of Pt Films on SrTiO3 (001) by Atomic Layer Deposition. ***Chem. Mater.*** 27, 6779 (2015)

36. Taeyueb Kim, Shin-Ik Kim, **Seung-Hyub Baek**, Jinki Hong, and Hyun Cheol Koo, Conductance Change Induced by the Rashba Effect in the LaAlO3/SrTiO3 Interface. ***J. Nanosci. NanoTech.*** 15, 8632 (2015)

37. Sung-Jin Jung, Sun-Young Park, Byung Kyu Kim, Beomjin Kwon, Seong Keun Kim, Hyung-Ho Park, Dong-Ik Kim, Ju-Young Kim, Dow-Bin Hyun, Jin-Sang Kim*, **Seung-Hyub Baek***, Hardening of Bi-Te based alloys by dispersing B4C nanoparticles. ***Acta Mater.*** 97, 68 (2015)

38. Min-Gyu Kang, Seung-Min Oh, Woo-Suk Jung, Hi Gyu Moon, **Seung-Hyub Baek**, Sahn Nahm, Seok-Jin Yoon & Chong-Yun Kang, Enhanced piezoelectric properties of vertically aligned singlecrystalline NKN nano-rod arrays. ***Sci. Rep.*** 5, 10151 (2015)

39. Kwang-Chon Kim, Beomjin Kwon, Hyun Jae Kim, **Seung-Hyub Baek**, Dow-Bin Hyun, Seong Keun Kim, Jin-Sang Kim, Sn doping in thermoelectric Bi2Te3 films by metal-organic chemical vapor deposition. ***Appl. Surf. Sci.*** 353, 232 (2015)

40. Jung Joon Pyeon, Cheol Jin Cho, **Seung-Hyub Baek**, Chong-Yun Kang, Jin-Sang Kim, Doo Seok Jeong and Seong Keun Kim, Control of the initial growth in atomic layer deposition of Pt films by surface pretreatment. ***Nanotech.*** 26, 1 (2015)

41. Beomjin Kwon, **Seung-Hyub Baek**, Seong Keun Kim, Dow-Bin Hyun, Jin-Sang Kim, A differential method for measuring cooling performance of a thermoelectric module. ***Appl. Therm. Engineer.*** 87, 209 (2015)

42. Shin-Ik Kim, Hyo Jin Gwon, Dai-Hong Kim, Seong Keun Kim, Ji-Won Choi, Seok-Jin Yoon, Hye Jung Chang, Chong-Yun Kang, Beomjin Kwon, Chung-Wung Bark, Seong-Hyeon Hong, Jin-Sang Kim* & **Seung-Hyub Baek***, Giant Electroresistive Ferroelectric Diode on 2DEG. ***Sci. Rep.*** 5, 10548 (2015)

43. Chan-Rok Park, Shin-Ik Kim, Seon Young Moon, Yil-Hwan You, Jung Hwan Seo, **Seung-Hyub Baek**, Seong Keun Kim, Chong-Yun Kang, Jin-Sang Kim, Jin-Ha Hwang, Impedance-based interfacial analysis of the LaAlO 3/SrTiO 3 oxide heterostructure involving a 2-dimensional electron gas layer. ***J. Phys. Chem. Solids*** 82, 60 (2015)

44. Woo-Suk Jung, Min-Jae Lee, Min-Gyu Kang, Hi Gyu Moon, Seok-Jin Yoon, **Seung-Hyub Baek***, Chong-Yun Kang*, Powerful curved piezoelectric generator for wearable applications. ***Nano Energy*** 13, 174 (2015)

45. Woo-Suk Jung, Min-Gyu Kang, Hi Gyu Moon, **Seung-Hyub Baek**, Seok-Jin Yoon, Zhong-Lin Wang, Sang-Woo Kim & Chong-Yun Kang, High Output Piezo/Triboelectric Hybrid Generator. ***Sci. Rep.*** 5, 9309 (2015)

46. Kwang-Chon Kim, Beomjin Kwon, Hyun Jae Kim, **Seung-Hyub Baek**, Chan Park, Seong Keun Kim, and Jin-Sang Kim, Thermoelectric Properties of Sn-Doped Bi0.4Sb1.6Te3 Thin Films. ***J. Electron. Mater.*** 44, 1573 (2015)

47. Jae-Uk Lee, Deuk-Hee Lee, Beomjin Kwon, Dow-Bin Hyun, Sahn Nahm, **Seung-Hyub Baek**, and Jin-Sang Kim, Effect of Sn Doping on the Thermoelectric Properties of n-type Bi2(Te,Se)3 Alloys. ***J. Electron. Mater.*** 44, 1926 (2015)

48. Joohwi Lee, Jong Kwon Choi, Seon Young Moon, Jaehong Park, Jin-Sang Kim, Cheol Seong Hwang, **Seung-Hyub Baek**, Jung-Hae Choi, and Hye Jung Chang, Symmetry-dependent interfacial reconstruction to compensate polar discontinuity at perovskite oxide interfaces (LaAlO3/SrTiO3 and LaAlO3/CaTiO3). ***Appl. Phys. Lett.*** 106, 071601 (2015)

49. Seong Keun Kim, Shin-Ik Kim, Hyungkwang Lim, Doo Seok Jeong, Beomjin Kwon, **Seung-Hyub Baek** & Jin-Sang Kim, Electric-field-induced Shift in the Threshold Voltage in LaAlO3/SrTiO3 Heterostructures. ***Sci. Rep.*** 5, 8023 (2015)

50. Kwang-Chon Kim, Cheol Jin Cho, Joohwi Lee, Hyun Jae Kim, Doo Seok Jeong, **Seung-Hyub Baek**, Jin-Sang Kim, and Seong Keun Kim, Enhancement of Initial Growth of ZnO Films on Layer-Structured Bi2Te3 by Atomic Layer Deposition. ***Chem. Mater.*** 26, 6448 (2014)

51. Jin Gwan Joung, Shin-Ik Kim, Seon Young Moon, Dai-Hong Kim, Hyo Jin Gwon, Seong-Hyeon Hong, Hye Jung Chang, Jin-Ha Hwang, Beom Jin Kwon, Seong Keun Kim, Ji-Won Choi, Seok-Jin Yoon, Chong-Yun Kang, Kwang Soo Yoo, Jin-Sang Kim, and **Seung-Hyub Baek***, Nonvolatile Resistance Switching on Two-dimensional Electron gas. ***ACS Appl. Maters. Interfaces*** 6, 17785 (2014)

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53. Hyo Min Kang, **Seung-Hyub Baek**, Jong Han Song, Yong Soo Cho, and Ji-Won Choi, Full Range Dielectric Characteristics of Calcium Copper Titanate Thin Films Prepared by Continuous Composition-Spread Sputtering. ***ACS Comb. Sci.*** 16, 478 (2014)

54. Haeri Kim, Seon Young Moon, Shin-Ik Kim, **Seung-Hyub Baek**, Ho Won Jang, and Dong-Wook Kim, Influence of Gas Ambient on Charge Writing at the LaAlO3/SrTiO3 Heterointerface. ***ACS Appl. Mater. Interfaces*** 6, 14037 (2014)

55. Beomjin Kwon, Im-Jun Roh, **Seung-Hyub Baek**, Seong Keun Kim, Jin-Sang Kim, and Chong-Yun Kang, Dynamic temperature response of electrocaloric multilayer capacitors. ***Appl. Phys. Lett.*** 104, 213902 (2014)

56. Jon E. Giencke, Chad M. Folkman, Seung-Hyub Baek, Chang-Beom Eom, ***Curr. Opin. Solid State Mater. Sci.*** 18, 39 (2014)

57. Sung-Jin Jung, Seon Keun Kim, Hyung-Ho Park, Dow-Bin Hyun, **Seung-Hyub Baek**, and Jin-Sang Kim, Thermoelectric Properties of Highly Deformed and Subsequently Annealed p-Type (Bi0.25Sb0.75)2Te3 Alloys. ***J. Electron. Mater.*** 43, 1726 (2014)

58. Deuk-Hee Lee, Jae-Uk Lee, Sung-Jin Jung, **Seung-Hyub Baek**, Ju-Heon Kim, Dong-Ik Kim, Dow-Bin Hyun, and Jin-Sang Kim, Effect of Heat Treatment on the Thermoelectric Properties of Bismuth-Antimony-Telluride Prepared by Mechanical Deformation and Mechanical Alloying. ***J. Electron. Mater.*** 43, 2255 (2014)

59. Kwang-Chon Kim, **Seung-Hyub Baek**, Hyun-Jae Kim, Dow-Bin Hyun, Seon Keun Kim, and Jin-Sang Kim, Thermopower Enhancement of Bi2Te3 Films by Doping I Ions. ***J. Electron. Mater.*** 43, 2000 (2014)

60. Beomjin Kwon, **Seung-Hyub Baek**, Seong Keun Kim, and Jin-Sang Kim, Impact of parasitic thermal effects on thermoelectric property measurements by Harman method. ***Rev. Sci. Phys.*** 85, 045108 (2014)

61. Sung-Jin Jung, Ju-Heon Kim, Dong-Ik Kim, Seong Keun Kim, Hyung-Ho Park, Jin-Sang Kim, Dow-Bin Hyun* and **Seung-Hyub Baek***, Strain-assisted, low-temperature synthesis of high-performance thermoelectric materials. ***Phys. Chem. Chem. Phys.*** 16, 3529 (2014)

62. P. Gao, J. Britson, J.R. Jokisaari, C.T. Nelson, **S.H. Baek**, Y. Wang, C.B. Eom, L.Q. Chen, X.Q. Pan, Atomic-scale mechanisms of ferroelastic domain wall mediated ferroelectric switching. ***Nature Commun.*** 4, 2791 (2013).

63. S.J. Jung, S.K. Kim, H.H. Park, D.B. Hyun, **S.H. Baek***, J.S. Kim*, Thermoelectric Properties of Highly Deformed and Subsequently Annealed p-Type $(Bi_{0.25}Sb_{0.75})_2Te_3$ Alloys ***J. of Electron. Mater.*** DOI: 10.1007/s11664-013-2851-1 (2013).

64. J.E. Giencke, C.M. Folkman, **S.H. Baek**, C.B. Eom, Tailoring the domain structure of epitaxial BiFeO3 thin films. ***Current Opinion in Solid State & Materials Science,*** Accepted (2013).

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66. J.P. Podkaminer, T. Hernandez, M. Huang, S. Ryu, C.W. Bark, S.H. Baek, J.C. Frederick, T.H. Kim, K.H. Cho, J. Levy, M.S. Rzchowski, C.B. Eom, "Creation of a two-dimensional electron gas and conductivity switching of nanowires at the $LaAlO_3/SrTiO_3$ interface grown by 90 degrees off-axis sputtering". ***Appl. Phys. Lett.*** **103**, 071604 (2013)

67. **S.H. Baek**, C.B. Eom, "Epitaxial integration of perovskite-based multifunctional oxides on silicon". ***Acta Mater.*** **61**, 2734-2750 (2013).

68. D.W. Jeong, H.C. Choi, C.H. Kim, S.H. Chang, C.H. Sohn, H.J. Park, T.D. Kang, D.Y. Cho, **S.H. Baek**, C.B. Eom, J.H. Shim, J. Yu, K.W. Kim, S.J. Moon, T.W. Noh, "Temperature Evolution of Itinerant Ferromagnetism in $SrRuO_3$ Probed by Optical Spectroscopy". ***Phys.Rev. Lett*****.** 110, 247202 (2013).

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72. **S.H. Baek,** M.S. Rzchowski, V.A. Aksyuk, "Giant piezoelectricity in PMN-PT thin films: Beyond PZT". ***MRS Bull*. 37**, 1022 (2012).
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PATENTS

	특허제목	년월	국가	상태	번호
1	넓은 동작 주파수 범위를 갖는 자가 공진 조절 압전 발생 장치	201808	한국	출원	2018-0101978
2	이차원 층상구조 황화주석 박막의 합성 방법	201805	한국	출원	2018-0058386
3	반도체 메모리 소자의 커패시터 유전막 및 그 제조 방법	201804	한국	출원	2018-0047915
4	리튬-철-망간 인산화합물 양극 활물질 조성물, 이를 이용한 리튬 이차전지	201803	한국	출원	2018-0034957
5	맥신(MXene)을 포함하는 열전 재료	201806	미국	출원	15/996,706
6	변위 확대를 통한 유연 압전 발전 장치	201710	한국	출원	2017-0133222
7	다결정 박막 트랜지스터 제조 방법	201710	한국	출원	2017-0134730
8	황화주석(II) 박막 및 그 박막의 합성 방법	201709	한국	출원	2017-0122094
9	아치형 압전 에너지 하베스터 모듈	201707	한국	출원	2017-0088312
10	파우더 코팅 방법 및 그 장치	201707	한국	출원	2017-0088867
11	마이크로 볼로미터를 위한 바나듐 산화물 박막 제조 방법	201803	미국	출원	15/926366
12	p 형 반도체의 오믹 접촉을 위한 바인더가 첨가된 MoO2 와 ReO2 페이스트 및 공정	201805	미국	출원	15/990824
13	Zn 이 첨가된 SnO2 투명 도전 조성물 및 다층 투명 전도 박막의 제조방법	201807	한국	등록	10-1884643
14	무기 열전재료의 성형 금형, 성형 장치 및 이를 이용한 성형방법	201711	한국	출원	10-2017-0145347
15	스마트렌즈용 전고상 박막 이차전지	201807	미국	출원	16/044510
16	반도체 메모리 소자용 커패시터 산화물 전극 제조법	201808	한국	등록	10-1892632
17	반도체 메모리 소자용 금속 전극 제조방법	201808	미국	등록	10062699
18	열전 반도체의 열전도도 및 열전 성능지수 측정방법	201804	한국	등록	10-1848012
19	이차원 이황화주석 박막의 형성 방법	201612	한국	출원	2016-0174500
20	고효율 열전재료 및 모듈의 제조방법	201705	미국	출원	15/609057
21	웨어러블 디바이스용 열전발전 시스템	201608	한국	등록	10-1843959
22	높은 유전상수를 갖는 barium strontium titanate 유전체의 제조 방법	201806	한국	등록	10-1867378
23	전자빔을 이용한 단결정 금속 산화물 나노구조 제조 방법	201801	한국	등록	10-1816222

24	박막형 적외선 흡수체를 포함하는 적외선 흡수 부재	201711	한국	등록	10-1803290
25	반도체 메모리 소자용 캐패시터 제조 방법	201604	한국	출원	2016-0046868
26	고효율 열전소재 제조방법	201711	한국	등록	10-1801787
27	냉간 변형을 이용한 고성능 열전 압출 소재 제조 방법	201802	한국	등록	10-1831150
28	고유전율과 저유전손실 특성의 은이 치환 된 스트론튬 나이오베이트 유전체 조성물	201807	일본	등록	6368751
29	스핀 열전 소자 및 이의 제조방법	201709	한국	등록	10-1780943
30	백금족 박막의 원자층 증착 방법	201508	한국	등록	10-1651512
31	나노 압력 센서	201711	한국	등록	10-1803288
32	나노 입자 첨가를 이용한 고강도 상온 열전 소재 제작 방법	201707	한국	등록	10-1758146
33	주석 질산화물계 단결정 박막의 성장 방법 및 투명전극의 제조 방법	201702	한국	등록	10-1712349
34	광전-열전 융합 발전 소자 제조 방법	201610	한국	등록	10-1665309
35	원자층증착법을 이용한 거대 결정 티타늄 산화물 박막의 제조 방법	201503	한국	출원	2015-0037964
36	원자층증착법을 이용한 반도체 소자의 박막 제조 방법	201503	한국	출원	2015-0034310
37	저항 매칭을 이용한 열전 모듈 제조 방법	201610	한국	등록	10-1670229
38	휘어진 압전에너지 발생 장치	201605	미국	출원	15/158158
39	엑시머 레이저 어닐링 법을 이용하여 저온결정화 된 리튬(이온) 유연 박막전지용 양극박막 및 유연 박막전지	201607	한국	등록	10-1637938
40	고유전율과 저유전손실 특성의 구리가 치환 된 스트론튬 나이오베이트 유전체 조성물	201511	한국	등록	10-1572614
41	압전-정전식 하이브리드형 전기에너지 발생장치	201604	한국	등록	10-1610738
42	나노 시트로 구성 된 적층 세라믹 캐패시터 및 제조방법	201607	일본	등록	5965466
43	산화물 전자 메모리 소자 및 그 제조방법	201410	한국	등록	1450093
44	관상 열전 모듈 및 그 제작 방법	201412	한국	등록	10-1471036
45	상호 접합 된 열전소재를 이용한 관형 열전모듈 및 관형 열전모듈의 제작 방법	201310	한국	출원	2013-0125974
46	고유전율과 저유전손실 특성을 가지는 비스무트 니오베이트 유전체 조성물	201512	일본	등록	5855159
47	냉간 성형을 이용한 고성능 열전 소재 제조 방법	201608	중국	등록	ZL201410157880.3
48	리튬 이온 이차전지용 실리콘/알루미늄 적층 다층 음극 박막 및 그 제조방법	201504	한국	등록	10-1509533

49	텔루르화 비스무트-셀렌화 인듐 나노복합체 열전 소재 및 그 제조 방법	201406	한국	등록	1405318
50	나이오베이트 유전체 조성물 및 이를 사용하는 나노시트 박막	201405	한국	등록	1398553
51	산화물 전자소자 및 그 제조방법	201411	미국	등록	8890142
52	고밀도 실장용 박막 콘덴서, 그 제조방법 및 고밀도 실장 기판	201401	한국	등록	1358939
53	압전 파우더와 중합체의 복합체를 이용한 플렉서블 압전 에너지 하베스팅 소자의 제조 방법	201508	미국	등록	9118000
54	레이저 리프트 오프 방법을 이용한 산화물 박막 평면 소자의 제조 방법	201409	미국	등록	8828845
55	평면형 다단 열전 모듈 및 그 제조방법	201410	한국	등록	1450088