

Curriculum Vitae

Ph.D. of Engineering Lee, Jong-Gun



NanoEngineering Group

Faculty of Mechanical Engineering

D. Dan & Betty Kahn Bldg.

Technion-Israel Institute of Technology, Haifa, Israel

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EDUCATION

2017 - present : PostDoc, Mechanical Engineering,

Technion-Israel Institute of Technology (Host : Prof. Eyal Zussman)

2013 - 2017 : D.Sc., Mechanical Engineering,

Korea University (Advisor : Sam Sukgoo Yoon)

2011 - 2013 : M.Sc., Mechanical Engineering,

Korea University (Advisor : Sam Sukgoo Yoon)

2005 - 2011 : B.Sc., Mechanical Engineering,

Chungnam National University

RESEARCH INTERESTS

Advanced Energy Applications : Solar Cell Silicon Solar cell(I-Gen.), Thin film Solar cell(II-Gen.), Dye-Sensitized Solar cell(III-Gen.), **Lithium Ion Battery** Anodes **Transparent Conducting Electrodes** AgNW

Photocatalysis Applications : Antibacterial activity, Water purification, Self-cleaning

Thin Film Coating Process : Cold Gas Dynamic Spray (CGDS) & Aerosol Deposition (AD)

Material Science : Silver nanowire(AgNW), Graphene(TCO, Heat sink), Lithium ion battery(Anode),

Ceramic(TiO₂), Metal(Copper, Nickel), Clay,

Curriculum Vitae

PUBLICATIONS

1. HS Jo, MW Kim, TG Kim, S An, HG Park, **JG Lee**, SC James, J Choi, SS Yoon*, “Supersonically spray-coated meshes as textured surface for pool boiling”, *International Journal of Thermal Sciences*, Submitted, 2017
2. TG Kim†, **JG Lee**†, CW Park, MW Kim, J Choi, SC James, MS Choi, WY Kim, JS Yang, SS Yoon*, “Scalable, Flexible Thermal Barrier Coatings of Supersonic Sprayed Clay, Silica, and Aerogel Micro-particles”, *Advanced Powder Technology*, Submitted, 2017
3. MW Kim, HS Jo, TG Kim, **JG Lee**, SC James, MS Choi, WY Kim, JS Yang, J Choi, SS. Yoon*, “Nano-textured Surfaces using Hybrid Micro- and Nano-Materials for Efficient Water Cooling”, *International Journal of Heat and Mass Transfer*, Submitted, 2017
4. HS Jo†, **JG Lee**†, TG Kim, HG Park, SC James, J Choi*, SS Yoon*, “Pool Boiling of Nanotextured Surfaces Generated through Supersonic Coating with Silver Nanowires”, *International Journal of Thermal Sciences*, Submitted, 2017
5. TG Kim†, **JG Lee**†, CW Park, HS Jo, MW Kim, M Hest, DH Cho, YD Chung, SS Yoon*, “Effect of supersonic spraying impact velocity on opto-electric properties of transparent conducting flexible films consisting of silver nanowire, ITO, and polyimide multilayers”, *Journal of Alloys and Compounds* (IF=3.133), 739(30), 653-659, 2018
6. **JG Lee**, S An, TG Kim, MW Kim, HS Jo, MT Swihart, A Yarin, SS Yoon*, “Self-cleaning,, anticondensing glass via supersonic spraying of silver nanowires, silica and polystyrene nanoparticles”, *ACS Applied Materials & Interfaces* (IF=7.504), 9(40), 35325-35332, 2017
7. **JG Lee**, B Joshi, S An, JS Lee, YK Hwang, JS Chang*, SS Yoon*, “Supersonically Sprayed Gas- and Water-sensing MIL-100(Fe) Films”, *Journal of Alloys and Compounds* (IF=3.133), 722(25), 996-1001, 2017
8. BH Bang, CS Ahn, **JG Lee**, YT Kim, MY Lee, B Hom, D Maik, K Thomas, SC James, A Yarin, SS Yoon*, “Theoretical, Numerical, and Experimental Investigation of Pressure Rise due to Deflagration in confined Spaces”, *International Journal of Thermal Sciences* (IF=3.615), 120, 469-480, 2017
9. **JG Lee**, DY Kim, JH Lee, HG Park, SS. Al-Deyab, HW Lee, JS Kim, DH Yang, A Yarin, SS Yoon*, “Supersonically Sprayed Copper-Nickel Microparticles as Flexible and Printable Thin-Film High Temperature Heaters”, *Advanced Materials Interfaces* (IF=4.279), 4(17), 1700075, 2017
10. HS Jo, S An, **JG Lee**, HG Park, SS Al-Deyab, A Yarin, SS Yoon*, “Highly Flexible, Stretchable, Patternable, Transparent Copper Fiber Heater on a Complex 3D Surface”, *NPG Asia materials* (IF=9.157), 9, e347, 2017
11. S An†, B Joshi†, **JG Lee**†, MW Lee, YI Kim, MW Kim, HS Jo, SS Yoon*, “A Comprehensive Review on Wettability, Desalination, and Purification of Graphene at Water Interfaces”, *Catalysis Today* (IF=4.636), 295(15), 14-25, 2017
12. B Joshi†, **JG Lee**†, E Samuel, HS Jo, TG Kim, WY Yoon*, SS Yoon*, “Supersonically Blown reduced graphene oxide intertwined Fe-Fe₃C nanofibers for lithium ion battery anodes”, *Journal of Alloys and Compounds* (IF=3.133), 726, 114-120, 2017
13. HS Jo†, **JG Lee**†, S An, TG Kim, SC James, J Choi*, SS Yoon*, “Supersonically Sprayed, Triangular Copper lines for Pool Boiling Enhancement”, *International Journal of Heat and Mass Transfer* (IF=3.458), 113, 210-216, 2017
14. E Samuel†, **JG Lee**†, B Joshi, TG Kim, MW Kim, IW Seong, WY Yoon*, SS Yoon*, “Supersonic Cold Spraying of Titania Nanoparticles on Reduced Graphene Oxide for Lithium Ion Battery Anodes”, *Journal of Alloys and Compounds* (IF=3.133), 715(25), 161-169, 2017
15. **JG Lee**, JH Lee, S An, DY Kim, TG Kim, SS. Al-Deyab, A Yarin, SS Yoon*, “Highly Flexible, Stretchable, Wearable, Patternable, Transparent Heaters on Complex 3D Surface formed from Supersonically Sprayed Silver Nanowires”, *Journal of Materials Chemistry A* (IF=8.867), 5, 6677-6685, 2017
16. H Choi, **JG Lee**, XD Mai, SS Yoon*, S Jeong*, “Supersonically Spray-Coated Colloidal Lead Sulfide

Curriculum Vitae

- Quantum Dot Ink Solar Cell”, *Scientific Reports* (IF=4.259), 7, 622, 2017
17. **JG Lee**, B Joshi, JH Lee, TG Kim, DY Kim, SS. Al-Deyab, IW Seong, M Swihart, WY Yoon, SS Yoon*, “Stable High-Capacity Lithium Ion battery Anodes Produced by Supersonic Spray Deposition of Hematite Nanoparticles and Self-Healing Reduced Graphene Oxide”, *Electrochimica Acta* (IF=4.798), 228(20), 604-610, 2017
 18. **JG Lee**, DY Kim, S An, JH Lee, S Sinha-ray, A Yarin, M Swihart, SS. Al-Deyab, SS Yoon*, “Production of flexible transparent conducting films of self-fused nanowires via one-step supersonic spraying”, *Advanced Functional Materials* (IF=12.124), 27(1), 1602548, 2017
 19. **JG Lee**, JH Lee, JY Yoon, JW Choi, MG Kang, JI Lee, H Song, SS Al-Deyab, SC James, Y Kang, D Kim, SS Yoon*, HS Lee*, “Effects of Conditions on the Electrical and Mechanical Properties of Supersonic Cold Sprayed Cu-Ni Electrodes”, *Journal of Alloys and Compounds* (IF=3.133), 965(25), 3714-3721, 2017
 20. JJ Park[†], **JG Lee**[†], DY Kim, JH Lee, JH Yoon, J Gwak, YJ Eo, A Cho, M Swihart, SS. Al-Deyab, SJ Ahn, DH Kim, SS. Yoon*, “Rapid supersonic spraying of Cu(In,Ga)(S,Se)₂ nanoparticles to fabricate a solar cell with 5.49 % conversion efficiency”, *Acta Materialia* (IF=5.301), 123, 44-54, 2017
 21. B Joshi[†], **JG Lee**[†], DY Kim, JH Lee, JS Lee, YK Hwang, JS Chang, SS Al-Deyab, JC Tan*, SS Yoon*. “Tuning Crystalline Structure of Zeolitic Metal–Organic Frameworks by Supersonic Spraying of Nanoparticle Suspensions”, *Materials & Design* (IF=4.364), 114(15), 416-423, 2016
 22. B Bang, C Ahn, DY Kim, **JG Lee**, H Kim, Y Jeong, W Yoon, SS. Al-Deyab, J Yoo, SS Yoon*, AL. Yarin*, “Breakup Process of Cylindrical Viscous Liquid Specimens after a Strong Explosion in the Core”, *Physics of Fluids* (IF=2.232), 28, 094105, 2016
 23. H Yoon, M Kim, H Kim, DY Kim, S An, **JG Lee**, B Joshi, HS Cho, J Choi, SS Al-Deyab, A Yarin, SS Yoon*, “Efficient heat removal via thorny devil nanofiber, silver nanowire, and graphene nanotextured surfaces”, *International Journal of Heat and Mass Transfer* (IF=3.458), 101, 198-204, 2016
 24. **JG Lee**, DY Kim, JH Lee, MW Kim, S An, HS Jo, C Nervi, SS. Al-Deyab, MT Swihart, SS Yoon*, “Scalable Binder-Free Supersonic Cold Spraying of Nanotextured Cupric Oxide(CuO) Films as Efficient Photocathodes”, *ACS Applied Materials Interfaces* (IF=7.504), 8(24), 15406-15414, 2016
 25. **JG Lee**, DY Kim, B Joshi, JH Lee, TK Lee, JS Lee, DH Yang, SS Al-Deyab, SS Yoon*, “Electrically insulative performances of ceramic and clay films deposited via supersonic spraying”, *Journal of Thermal Spray Technology* (IF=1.488), 25(4), 763-769, 2016
 26. S An, DY Kim, **JG Lee**, HS Jo, MW Kim, SS Al-Deyab, J Choi*, SS Yoon*, “Supersonically sprayed reduced graphene oxide film to enhance critical heat flux in pool boiling”, *International Journal of Heat and Mass Transfer* (IF=2.458), 98, 124-130, 2016
 27. BJ Kang, KD Lee, **JG Lee**, SS Yoon, YM Kang, HS Lee, DH Kim*, “Influence of particle velocity of copper on emitter contact by cold spray method”, *Journal of Thermal Spray Technology* (IF=1.488), 25(3), 465-472, 2016
 28. DY Kim, B Joshi, **JG Lee**, JH Lee, JS Lee, YK Hwang, JS Chang, SS. Al-Deyab, JC Tan, SS Yoon*, “Scalable Supersonic Cold Spraying for Zeolitic Metal-Organic Framework Thin Films”, *Chemical Engineering Journals* (IF=6.216), 295, 49-56, 2016
 29. DY Kim[†], **JG Lee**[†], B Joshi, JH Lee, SS. Al-Deyab, HG Yoon, DR Yang, A Yarin, SS Yoon*, “Supersonically sprayed thermal barrier layers using clay micro-particles”, *Applied Clay Science* (IF=3.101), 120, 142-146, 2016
 30. **JG Lee**, DY Kim, MG Mali, SS Al-Deyab, MT Swihart, SS Yoon*, “Supersonically blown nylon-6 nanofibers entangled with graphene flakes for water purification”, *Nanoscale* (IF=7.367), 7, 19027-19035, 2015
 31. **JG Lee**, DY Kim, B Kang, D Kim, SS Al-Deyab, SC James, SS Yoon*, “Thin film metallization process by supersonic spraying copper nickel nanoparticles on a silicon substrate”, *Computational Materials Science* (IF=2.292), 108, Part A, 114-120, 2015
 32. **JG Lee**, YH Cha, DY Kim, JH Lee, SC James, SS. Al-Deyab, TK Lee, WY Kim, SS Yoon*, “Robust mechanical properties of electrically insulative alumina films by supersonic aerosol deposition”, *Journal of Thermal Spray Technology* (IF=1.488), 24(6), 1046-1051, 2015
 33. **JG Lee**, DY Kim, B Kang, D Kim, HE Song, J Kim, W Jung, D Lee, SS Al-Deyab, SC James, SS Yoon*,

Curriculum Vitae

- “Nickel-copper hybrid electrodes self-adhered onto silicon wafer by supersonic cold-spray”, *Acta Materialia* (IF=5.301), 93, 156-163, 2015
34. JJ Park[†], **JG Lee**[†], SC James, SS Al-Deyab, SS Yoon*, “Thin-film metallization of CuInGaSe₂ nanoparticles by supersonic kinetic spraying”, *Computational Materials Science* (IF=2.292), 101, 66-76, 2014
 35. DY Kim[†], **JG Lee**[†], BN Joshi, SS Latthe, SS Al-Deyab, SS Yoon*, “Self-cleaning superhydrophobic films by supersonic-spraying polytetrafluoroethylenetitanium nanoparticles”, *Journal of Material Chemistry A* (IF=8.867), 3, 3975-3983, 2015
 36. **JG Lee**, DY Kim, JJ Park, YH Cha, JY Yoon, HS Jeon, BK Min, MT Swihart, SH Jin, SS Al-Deyab, SS Yoon*, “Graphene-titania hybrid photoanodes produced by supersonic kinetic aerosol deposition for solar water splitting”, *Journal of the American Ceramic Society* (IF=2.841), 97(11), 3660-3668, 2014
 37. DY Kim, S Sinha-Ray, JJ Park, **JG Lee**, YH Cha, SH Bae, JH Ahn, YC Jung, S Kim, AL Yarin, SS Yoon*, “Self-healing reduced graphene oxide films by supersonic kinetic spraying”, *Advanced Functional Materials* (IF=12.124), 24(31), 4986-4995, 2014
 38. DY Kim, BN Joshi, JJ Park, **JG Lee**, YH Cha, TY Seong, SI Noh, HJ Ahn, SS Yoon*, “Graphene-titania films by supersonic kinetic spraying for enhanced performance of dye-sensitized solar cells”, *Ceramics International* (IF=2.758), 40(7), Part B, 11089-11097, 2014
 39. JJ Park, DY Kim, **JG Lee**, MT Swihart, SS Yoon*, “Supersonic Aerosol-Deposited TiO₂ Photoelectrodes for Photoelectrochemical Solar Water Splitting”, *RSC Advances* (IF=3.108), 4, 8661-8670, 2014
 40. AB Gurav, SS Latthe, RS Whatkar, **JG Lee**, DY Kim, JJ Park, SS Yoon*, “Superhydrophobic surface decorated with vertical ZnO nanorods modified by stearic acid”, *Ceramics International* (IF=2.986), 40(5), 7151-7160, 2014
 41. JJ Park, DY Kim, SS Latthe, **JG Lee**, MT Swihart, SS Yoon*, “Thermally-Induced Superhydrophilicity in TiO₂ Films Prepared by Supersonic Aerosol Deposition”, *ACS Applied Materials & Interfaces* (IF=7.504), 5(13), 6155-6160, 2013
 42. DY Kim, JJ Park, **JG Lee**, M van Hest, SS Yoon*, “Wettability and photocatalysis of CF₄ plasma etched titania films of honeycomb structure”, *Ceramics International* (IF=2.986), 39(8), 9737-9742, 2013
 43. DY Kim, JJ Park, **JG Lee**, D Kim, SJ Tark, S Ahn, JH Yun, J Gwak, KH Yoon, S Chandra, SS Yoon*, “Cold Spray Deposition of Copper Electrodes on Silicon and Glass Substrates” *Journal of Thermal Spray Technology* (IF=1.488), 22, (7), 1092-1102, 2013
 44. JJ Park, DY Kim, **JG Lee**, D Kim, JH Oh, TY Seong, M van Hest, SS Yoon*, “Superhydrophilic Transparent Titania Films by Supersonic Aerosol Deposition”, *Journal of the American Ceramic Society* (IF=2.841), 96(5), 1596-1601, 2012
 45. JJ Park, **JG Lee**, DY Kim, JH Hong, JJ Kim, S Hong, SS Yoon*, “Antibacterial and Water Purification Activities of Self-Assembled Honeycomb Structure of Aerosol Deposited Titania Film”, *Environmental Science & Technology* (IF=6.198), 46, 12510-12518, 2012
 46. DY Kim, JJ Park, **JG Lee**, MW Lee, HY Kim, JH Oh, TY Seong, D Kim, SC James, M van Hest, S Chandra, SS Yoon*, “Tuning Hydrophobicity with Honeycomb Surface Structure and Hydrophilicity with CF₄ Plasma Etching for Aerosol-Deposited Titania Films”, *Journal of the American Ceramic Society* (IF=2.841), 95, 3955-3961, 2012

Note: (*)*, corresponding author,

([†]), equal contribution

Curriculum Vitae

CONFERENCES

1. TG Kim, **JG Lee**, SS Yoon*, “The Electrical and Mechanical Properties of Kinetic Sprayed Ni-Cu Electrodes”, *Global Photovoltaic Conferences 2017 (GPVC 2017)*, Gwangju, Korea, Mar. 15-17, 2017
2. WY Kim, DH Yang, SS Yoon*, **JG Lee**, “Mechanical properties of clay films deposited via cold spraying”, FISITA 2016, Busan, Korea, Sep. 26-30, 2016
3. JH Lee, DY Kim, B Joshi, **JG Lee**, SS Yoon*, “Fabricate Zeolitic Metal-Organic Framework Films via Supersonic Cold Spraying”, *Nano Korea*, Ilsan, Korea, Jul. 13-15, 2016
4. **JG Lee**, DY Kim, JH Lee, SS Yoon*, “Supersonic Sprayed Ceramic and Clay Films for Electrical Insulation”, *Global Photovoltaic Conferences 2016 (GPVC 2016)*, Daegu, Korea, Apr. 6-8, 2016
5. JJ Park, DY Kim, **JG Lee**, JH Lee, SS Yoon*, “Rapid supersonic spraying of Cu(In,Ga)(S,Se)₂ nanoparticles to fabricate a solar cell with 5.49 % conversion efficiency”, *Global Photovoltaic Conferences 2016 (GPVC 2016)*, Daegu, Korea, Apr. 6-8, 2016
6. **JG Lee**, “Fabricate nylon-6/graphene membrane via cold spray for water purification”, 5th Annual International Conference on SEES2016, Singapore, Feb. 22-24, 2016
7. **JG Lee**, DY Kim, SS Yoon*, “Nickel-copper hybrid electrodes self-adhered onto silicon wafer by supersonic cold-spray”, ASME-JSME-KSME Joint Fluids Engineering Conference, Seoul, Korea, Jul. 26-31, 2015
8. SS Yoon*, **JG Lee**, DY Kim, “Nickel-copper electrodes onto a silicon wafer by cold spray coating process”, *Korea Photovoltaic Society*, Busan, Korea, Apr. 29-30, 2015
9. JJ Park, **JG Lee**, DY Kim, M Liou, SS Yoon*, “Kinetically metallized carbon-free CuInGaSe₂ solar cell by supersonic spraying dry nanoparticles”, *The 6th World Conference on Photovoltaic Energy Conversion(WCPEC-6)*, Kyoto, Japan, Nov. 23-27, 2014
10. H Yoon, **JG Lee**, S An, JY Choi, YH Cha, C Lee, SS Yoon*, “Enhanced photodegradation performance of Nb doped ZnO thin films prepared by electrostatic spray deposition”, *Electrochemical Conference on Energy & The Environment (ECEE 2014)*, Shanghai, China, Mar. 13-16, 2014
11. JJ Park, DY Kim, **JG Lee**, YH Cha, SS Yoon*, “Tuning Hydrophobicity Using Cold Sprayed Teflon/Titania Composite Thin Films”, *Global Photovoltaic Conferences 2013 (GPVC 2013)*, Busan, Korea, Nov. 23-26, 2013
12. JJ Park, DY Kim, **JG Lee**, YH Cha, SS Yoon*, “Titania Composite Thin Films for Acute Inkjet Printing”, *Global Photovoltaic Conferences 2013 (GPVC 2013)*, Busan, Korea, Nov. 23-26, 2013
13. JJ Park, DY Kim, **JG Lee**, SS Yoon*, “Solution Precursor Graphene Coating by Cold Spray”, *KSME (The Korea Society of Mechanical Engineers)*, Jeju, Korea, May, 9-10, 2013
14. DY Kim, JJ Park, **JG Lee**, SS Yoon*, “Fabrication of CISSe Thin Film Solar Cell via Cold Spray”, *KPVC (Korea Photovoltaic Society 2013)*, Suwon, Korea, Apr. 29-30, 2013
15. **JG Lee**, JJ Park, DY Kim, Sam S. Yoon*, “Low-cost Copper-based Front Electrode Manufacture for Crystalline Silicon and CIS Solar Cells by Cold Spray”, *GPVC (Global Photovoltaic Conference 2012)*, Busan, Korea, Aug. 27-29, 2012

Note: (*)*, corresponding author

PATENT

1. SS Yoon, **JG Lee**, DY Kim, JJ Park, MW Lee, “Apparatus for manufacturing a solar cell substrate with cold spraying and method for controlling the same”, PCT-KR-2012-972, pending.
2. SS Yoon, KH Yoon, JJ Park, DY Kim, **JG Lee**, JH Gwak, JH Yun, SJ Ahn, Ara Cho, KS Shin, “Grid electrode for solar cell, fabrication method an apparatus of grid electrode”, 10-2012-0124609
3. SS Yoon, DY Kim, JJ Park, MW Lee, **JG Lee**, “무기물 박막 태양전지 제조 장치 및 이의 제어방법”, 10-1311107
4. SS Yoon, **JG Lee**, DY Kim, “나노텍스처 방열판 및 그 제조방법”, 10-2015-0152111
5. SS Yoon, **JG Lee**, JJ Park, DY Kim, “실리콘 입자 분쇄장치”, 10-1732260

Curriculum Vitae

AWARD and GRANTS

1. Award for Best Graduate Student, Engineering College, Korea University, 2016
 2. Award for Best Graduate Student, Department of Mechanical Engineering, Korea University, 2015
 3. Achievement Award, Korea University, 2015
 4. Research Assistant, 2012 Spring ~ Fall, 2013 Fall ~ 2015 Spring
 5. BK21, 2014 Spring ~ 2017 Spring
-

SKILLS

Device fabrication: Aerosol deposition, Cold spray thin film deposition

Measurement techniques: Atomic force microscopy(AFM), Scanning electron microscopy(SEM), Transmission electron microscopy(TEM), X-ray diffraction(XRD), UV-vis spectrophotometer, Schlieren method, Dynamic water contact angle measurement, Fourier Transform Infrared Spectroscopy (FT-IR)

Computational simulation: Computational Fluid Dynamics (Fluent, Gambit)

Computer Proficiency: Windows 98 - Window 7, MS – Office 2003 - 2010, Origin 8

Reference

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Curriculum Vitae

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