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Education

Ph. D candidate in GIFT 2023.09~Present
Pohang University of Science and Technology (POSTECH), Advisor: Hyoung Seop Kim
M.S. in GIFT 2021.09~2023.08
Pohang University of Science and Technology (POSTECH), Advisor: Hyoung Seop Kim
B.S. in Mechanical Engineering 2021.08
Pohang University of Science and Technology (POSTECH), Korea, 2021

Honors and Awards

2026 Wonik Next-Generation Engineer Grand Prize (원익상 최우수상), National Academy of Engineering of Korea (NAEK, 한국공학한림원) : Selection of one person in science and engineering in South Korea
2025 Changseong Talent Award (창성인재상), KPMI fall conference
2025 Next Generation Engineering Researcher Award (차세대 공학연구자상), Grand Prize, Institute for Promotion of Engineering and Science of Korea
: Selecting one person per major university department in South Korea
2025 Yuhan Scholarship (유일한 장학금), Yuhan Foundation
2024 Talent Award of Korea (대한민국 인재상), Deputy Prime Minister Award
: Selection of 50 Young People of Korea
2024 Acta student awards, Acta Materialia, Inc.
: Selected 4 people from around the world
2024 Best Paper Award, POSTECH
2024 Jinhap Academic Award (진합학술상), KSTP fall conference
2024 Best oral presentation award, KIM fall conference
2024 Best oral presentation award, KIM spring conference

2023 Best poster award, The 8th International Conference on Laser Peening and Related Phenomena

2022 Best oral presentation award, KIM spring conference

Publication

Total Publication: 63 (1 st author papers: 18, co-authored papers: 45)		
Total citation: 919	h-index: 19	i10-hindex: 35

1st-authorship publication

1. **Rae Eon Kim**, Gang Hee Gu, Soung Yeoul Ahn, Yoon-Uk Heo, Jongun Moon, Qingfeng Wu, Hobyung Chae, Youl Baik, Wanchuck Woo, Hyeonseok Kwon, Hidemi Kato, Hyoung Seop Kim, Dual-gradient structure induced spreadable phase transformation for simultaneously improving strength and ductility, **Acta Materialia** 275 (2024) 120060.
2. **Rae Eon Kim**, Jae Heung Lee, Farahnaz Haftlang, Sang-Ho Oh, Byeong-Joo Lee, Qingfeng Wu, Yoon-Uk Heo, Hyoung Seop Kim, Hierarchical ferrous medium entropy with heterogeneous precipitates embedded in core-shell grain structure for superior mechanical properties, **Acta Materialia** (2024) 120397.
3. **Rae Eon Kim**, Jaehun Kim, Yeon Taek Choi, Sujung Son, Shiwoo Lee, Hyojeong Ha, Hyojin Park, Hyoung Seop Kim, The effect of laser surface treatment for cellular structure-induced metastability in ferrous medium-entropy alloy, *Journal of Materials Research and Technology* 36 (2025) 1105–1114
4. **Rae Eon Kim**, Gangaraju Manogna Karthik, Auezhan Amanov, Yoon-Uk Heo, Sang Guk Jeong, Gang Hee Gu, Hyojin Park, Eun Seong Kim, Hyoung Seop Kim, Superior gradient heterostructured alloys fabricated by laser powder bed fusion via annealing and ultrasonic nanocrystal surface modification, *Scripta Materialia* 230 (2023) 115422.
5. **Rae Eon Kim**, Gang Hee Gu, Yeon Taek Choi, Jeong Ah Lee, Hyoung Seop Kim, Superior tensile properties and formability synergy of high-entropy alloys through inverse-gradient structures via laser surface treatment, *Scripta Materialia* 234 (2023) 115587.
6. **Rae Eon Kim**, Gang Hee Gu, Hyeonseok Kwon, Soung Yeoul Ahn, Jihye Kwon, Jeong Ah Lee, Yeon Taek Choi, Min Hong Seo, Hyoung Seop Kim. Role of synergistic hardening and damage evolution on the stretchability of Al1050/steel/Al1050 sheets, *Journal of Materials Research and Technology* 21 (2022) 3514–3525.
7. **Rae Eon Kim**, Sang Guk Jeong, Hyojeong Ha, Auezhan Amanov, Hyoung Seop Kim, Controlling defects of laser-powder bed fusion processed 316L stainless steel via ultrasonic nanocrystalline surface modification, *Materials Science and Engineering: A* 887 (2023) 145726.

8. **Rae Eon Kim**, Gang Hee Gu, Jeong Ah Lee, Yeon Taek Choi, Hyojin Park, Jaehun Kim, Min Hong Seo, Hyoung Seop Kim, Surface heterostructuring in laser-treated alloys through local austenitization for high strength and formability, *Materials Research Letters* 12 (2024) 709–718.
9. **Rae Eon Kim**, Eun Seong Kim, Gangaraju Manogna Karthik, Gang Hee Gu, Soung Yeoul Ahn, Hyojin Park, Jongun Moon, Hyoung Seop Kim, Heterostructured alloys with enhanced strength–ductility synergy through laser-cladding, *Scripta Materialia* 215 (2022) 114732.
10. **Rae Eon Kim**, Sang Guk Jeong, Hyojeong Ha, Yoon-Uk Heo, Auezhan Amanov, Gang Hee Gu, Dong Jun Lee, Jongun Moon, Hyoung Seop Kim, Surface heterostructuring of 316L stainless steel manufactured by laser powder bed fusion and hot isostatic pressing, *Materials Science and Engineering: A* 909 (2024) 146820.
11. **Rae Eon Kim**, Jongun Moon, Eun Seong Kim, Jungwan Lee, Hyoung Seop Kim, Surface heterostructuring of laser-clad 316L stainless steel through texture-driven deformation twinning, *Scripta Materialia* 208 (2022) 114332.
12. Jeongrak Lee*, Junghoon Lee*, **Rae Eon Kim***, Seonghyeon Kim, Kyungtae Kim, Youngsam Kwon, Hongjae Kang, Gunsu Yun, Dongsik Kim, Anna Lee, Hyoung Seop Kim, Architecture of Ti–6Al–4V thin-walled microthrusters fabricated via laser powder bed fusion, *Virtual and Physical Prototyping* 20 (2025) 2533944
13. **Rae Eon Kim**, Yeon Taek Choi, Sang Guk Jeong, Do Won Lee, Hyoung Seop Kim, Stretch–Flangeability of Laser Powder Bed Fusion–Processed 316L Stainless Steel, *Journal of Powder Materials*, 32 (2025) 87–97
14. **Rae Eon Kim**, Superior cryogenic mechanical properties of Fe-rich medium-entropy alloy with hierarchical heterostructure and phase transformation, *Materials Science and Engineering: A*, 22 (2025) 149326
15. **Rae Eon Kim***, Jumi Choi*, Ho Hyeong Lee, Bon Woo Koo, Shi Woo Lee, Sujung Son, Hyojeong Ha, Do Won Lee, Dong-Woo Suh, Hyoung Seop Kim, Cryogenic nano-twinning Engineering to mitigate the strength–hydrogen embrittlement trade-off in a high-entropy alloy, *Materials Research Letters*, 14 (2026) 96–106
16. **Rae Eon Kim**, Ho Hyeong Lee, Jaehun Kim, Junhyong Kim, Dong-Woo Suh, Renhao Wu, Zaigham Saeed Toor, Chahee Jung, Seok Su Sohn, Renlong Xiong, Hyoung Seop Kim, Mitigating Hydrogen Embrittlement Through Microstructural Shielding: Reverse-Gradient Design in High-Entropy Alloys, *Corrosion Science*, 264 (2026) 113760
17. **Rae Eon Kim***, Jaehun Kim*, Seok-Hwan Hong, Shi Woo Lee, Bon Woo Koo, Soo Vin Ha, Hyojeong Ha, Hyojin Park, Do Won Lee, Dong-Woo Suh, Hyoung Seop Kim, Bulk Displacive Reversion Enabled by Ultrafast Heating for Superior Mechanical Properties in a Metastable Ferrous Medium-Entropy Alloy, *Materials Science and Engineering: A*, 960 (2026) 150109
18. Jeongrak Lee*, **Rae Eon Kim***, Junghoon Lee*, Jinwoo Lee, Seonghyeon Kim, Jaehee Kim, Daewon Kang, Youngsam Kwon, Dongsik Kim, Anna Lee, Hyoung Seop Kim, Surface roughness engineering of mechanical interlocking for enhanced metal–

polymer adhesion in additive manufacturing, Virtual and Physical Prototyping. 21 (2026) e2653924

Co-authorship publications

19. Gang Hee Gu, Eun Seong Kim, Hyeonseok Kwon, Sujung Son, Rae Eon Kim, Taek Gwon Oh, Hyung Seop Kim, Fabrication of multi-gradient heterostructured CoCrFeMnNi high-entropy alloy using laser metal deposition, Materials Science and Engineering: A 836 (2022) 142718.
20. Gang Hee Gu, Rae Eon Kim, Eun Seong Kim, Jungwan Lee, Auezhan Amanov, Hyung Seop Kim, Multi-scale investigation on local strain and damage evolution of Al1050/steel/Al1050 clad sheet, Journal of Materials Research and Technology 21 (2022) 2880–2890.
21. Gang Hee Gu, Rae Eon Kim, Jungwan Lee, Hyung Seop Kim, Tailoring microstructure with spatial heterogeneity in CoCrFeMnNi high-entropy alloy via laser surface relaxation, Materials Science and Engineering: A 852 (2022) 143720.
22. Gang Hee Gu, Yongju Kim, Rae Eon Kim, Min Hong Seo, Hyung Seop Kim, A new digital image correlation method for measuring wide strain range true stress-strain curve of clad materials, Metals and Materials International 29 (2023) 168–173.
23. Yongju Kim, Gang Hee Gu, Rae Eon Kim, Min Hong Seo, Hyung Seop Kim, Deformation behavior of lightweight clad sheet: Experiment and modeling, Materials Science and Engineering: A 852 (2022) 143666.
24. Gang Hee Gu, Rae Eon Kim, Eun Seong Kim, Sujung Son, Hyung Seop Kim, Fabrication of structural and compositional heterostructured CoCrNi–CoCrFeMnNi multi-material using direct energy deposition additive manufacturing, Intermetallics 151 (2022) 107726.
25. Gang Hee Gu, Rae Eon Kim, Eun Seong Kim, Jungwan Lee, Auezhan Amanov, Hyung Seop Kim, Multi-layered heterostructured CoCrFeMnNi high-entropy alloy processed using direct energy deposition and ultrasonic nanocrystalline surface modification, Journal of Materials Research and Technology 21 (2022) 2880–2890.
26. Soung Yeoul Ahn, Eun Seong Kim, GM Karthik, KR Ramkumar, Sang Guk Jeong, Rae Eon Kim, Gang Hee Gu, Hyung Seop Kim, Thickness effect on the microstructures, mechanical properties, and anisotropy of laser-powder bed fusion processed 316L stainless steel, Journal of Materials Science 57 (2022) 18101–18117.
27. Jeong Ah Lee, Jaejung Park, Yeon Taek Choi, Rae Eon Kim, Jaimyun Jung, Seungchul Lee, Min Hong Seo, Hyung Seop Kim, Influence of tensile properties on hole expansion ratio investigated using a generative adversarial imputation network with explainable artificial intelligence, Journal of Materials Science 58 (2023) 4780–4794.
28. Soung Yeoul Ahn, Dong Geun Kim, Jeong Ah Lee, Eun Seong Kim, Sang Guk Jeong, Rae Eon Kim, Jungho Choe, Soon-Jik Hong, Pham Quang, Sunghak Lee, Hyung Seop Kim, Dynamic compression behavior of CoCrFeMnNi high-entropy alloy

- fabricated by direct energy deposition additive manufacturing, *Journal of Alloys and Compounds* 960 (2023) 170602.
29. Gang Hee Gu, Yongju Kim, Hyeonseok Kwon, Rae Eon Kim, Jungwan Lee, Hyoung Seop Kim, Large-scale fabrication method of heterostructured materials using conventional cold-rolling for industrial applications, *Journal of Materials Research and Technology* 27 (2023) 6358–6366.
 30. Sujung Son, Jungwan Lee, Peyman Asghari-Rad, Rae Eon Kim, Hyojin Park, Jae-il Jang, Wen Chen, Yoon-Uk Heo, Hyoung Seop Kim, Hierarchically heterogeneous microstructure and mechanical behavior of the multi-materials prepared by powder severe plastic deformation, *Materials Research Letters* 11 (2023) 915–924.
 31. Gang Hee Gu, Yongju Kim, Jae Heung Lee, Hyeonseok Kwon, Rae Eon Kim, Hyoung Seop Kim, A new finding on the benefits of heterostructured bake-hardenable steels: Enhanced strain aging ability, *Materials Science and Engineering: A* 893 (2024) 146120.
 32. Hyojin Park, Jungwan Lee, Rae Eon Kim, Sujung Son, Soung Yeoul Ahn, Hyoung Seop Kim, Effect of warm rolling on the structure and tensile properties of a metastable Fe-based medium entropy alloy, *Metals and Materials International* 30 (2024) 585–592.
 33. Yongju Kim, Gang Hee Gu, Rae Eon Kim, Min Hong Seo, Hyoung Seop Kim, Non HeteroDeformationInduced Hardening in Steel/Polymer/Steel Layered Sheet: Experiment and Modeling Analyses, *Advanced Engineering Materials* 26 (2024) 2301681.
 34. Sujung Son, Rae Eon Kim, Jungwan Lee, Jae-il Jang, Hyoung Seop Kim, Heterostructuring of BN-CoCrFeMnNi high-entropy alloy via severe plastic deformation, *Materials Science and Engineering: A* 909(2024) 146859.
 35. Hyeonseok Kwon, Eun Seong Kim, Yoon-Uk Heo, Jungho Choe, Rae Eon Kim, Soung Yeoul Ahn, Sang-Ho Oh, Jeong Min Park, Byeong-Joo Lee, Hyoung Seop Kim, Restructuring the cell network of non-equiatomic CoCrFeNiMoC medium-entropy alloy fabricated by laser powder bed fusion, *Journal of Materials Science & Technology* 214 (2025) 143–152.
 36. Man Jae SaGong, Jeong Ah Lee, Rae Eon Kim, Hyojin Park, Soung Yeoul Ahn, Hyunjoo Choi, Renhao Wu, Hyoung Seop Kim, Repairability and Effectiveness in Direct Energy Deposition of 316L Stainless Steel Grooves: A Comparative Study on Varying Laser Strategy, *Journal of Materials Research and Technology* 32 (2024) 3347–3356.
 37. Yeon Taek Choi, Jihye Kwon, Rae Eon Kim, Shin-Yeong Lee, Jaehun Kim, Jae Wung Bae, Hyoung Seop Kim, Effects of deformation-induced BCC martensitic transformation on uniaxial ductility and biaxial stretchability in metastable ferrous medium-entropy alloys, *Materials Science and Engineering: A* 913 (2024) 147065.
 38. Man Jae SaGong, Rae Eon Kim, Jeong Ah Lee, Hyojin Park, Soung Yeoul Ahn, Shuai Xu, Haiming Zhang, Renhao Wu, Hyoung Seop Kim, Enhanced strength-ductility

synergy in stainless steel 316L through hierarchically tailored microstructure via laser-based repair deposition, *Materials Research Letters* 12 (2024) 10.

39. Jiajia Shen, Rae Eon Kim, Jingjing He, JG Lopes, Jin Yang, Zhi Zeng, N Schell, Hyoung Seop Kim, JP Oliveira, Gas tungsten arc welding of CoCrFeMnNi high entropy alloy to 316 stainless steel, *Materials Science and Engineering: A* 922 (2025) 147664
40. Chan Woo Jung, Jae Hyuk Lee, Soo-Hyun Joo, Rae Eon Kim, Hyoung Seop Kim, Jongun Moon, Effect of laser surface treatment on microstructural evolution and mechanical properties of a Co–Cr–Fe–Ni–Mo medium–entropy alloy, *Materials Science and Engineering: A* 922 (2025) 147617
41. Hyejeong Ha, So Jin Jung, Sang Guk Jeong, Rae Eon Kim, Hyung-Ki Park, Hyoung Seop Kim, Enhancing hydrogen storage kinetics and capacity via particle size modulation in TiZrCrFeMnNi high–entropy alloy, *International Journal of Hydrogen Energy* 99 (2025) 1047–105
42. D Afonso, JG Lopes, YT Choi, RE Kim, N Schell, N Zhou, HS Kim, JP Oliveira, Dissimilar laser welding of an as–rolled CoCrFeMnNi high entropy alloy to Inconel 718 superalloy, *Optics & Laser Technology* 180 (2025) 111427
43. Jiajia Shen, Rae Eon Kim, Jingjing He, Jin Yang, JG Lopes, Zhi Zeng, N Schell, Hyoung Seop Kim, JP Oliveira, Excellent strength/ductility synergy by optimization of post–weld heat treatment for gas metal arc welded CoCrFeMnNi high entropy alloys with 410 stainless filler wire: High–throughput thermodynamic modeling with experimental validation, *Materials & Design* 249 (2025) 113556
44. KR Ramkumar, S Vigneshwaran, Chetan Singh, Rae Eon Kim, P Seenuvasaperumal, Hyoung Seop Kim, Effect of Cryorolling on Strengthening–Softening Transition in Deformation Twinned Cupronickel Alloy, *Metallurgical and Materials Transactions A* (2024) 1–8
45. Zaigham Saeed Toor, Jihye Kwon, Rae Eon Kim, Yeon Taek Choi, Gang Hee Gu, Min–Hong Seo, Kyung–Hwan Chung, Renhao Wu, Hyoung Seop Kim, Failure Behavior of Steel–Polymer–Steel Multi–Material Clad: Mechanical Performance and Microstructure Evolution, *Metals and Materials International* (2024) 1–15
46. Junghoon Lee, Arif Hussain, Jeonghong Ha, Youngsam Kwon, Rae Eon Kim, Hyoung Seop Kim, Dongsik Kim, Mechanical properties of Ti–6Al–4V thin walls fabricated by laser powder bed fusion, *Additive Manufacturing* 94 (2024) 104484
47. CW Jung, JH Lee, SH Joo, RE Kim, HS Kim, J Moon, Effect of laser surface treatment on microstructural evolution and mechanical properties of a Co–Cr–Fe–Ni–Mo medium–entropy alloy *Materials Science and Engineering: A* 922 (2025) 147617
48. CC Li, RE Kim, XG Qiao, WT Sun, L Yuan, HS Kim, T Sakai, RZ Valiev, MY Zheng, Achieving exceptional room–temperature ductility in ultrafine–grained Mg–0.8 Mn alloy via high pressure torsion, *Journal of Alloys and Compounds* 1020 (2025) 179411
49. Jiajia Shen, Rae Eon Kim, Martim Mestre, JG Lopes, Jingjing He, Jin Yang, Zhi Zeng, N Schell, Hyoung Seop Kim, JP Oliveira, Unveiling the macrosegregation formation mechanism and its impact on properties in dissimilar welding between CoCrFeMnNi

- high-entropy alloy and 316 stainless steel, *Journal of Materials Science* 60 (2025) 4432–4457
50. Shuxia Ouyang, Qingfeng Wu, **Rae Eon Kim**, Jae Heung Lee, Jeong Ah Lee, Hyoung Seop Kim, Recent Progress in Developing Creep-Resistant Mg-Gd-Based Alloys *Metals and Materials International* (2025)
 51. Do Won Lee, Jeong Ah Lee, Hyojin Park, **Rae Eon Kim**, Jungho Choe, Sun Ig Hong, Hyoung Seop Kim, Leveraging microstructural design to enhance strain hardening in porous CoCrFeMnNi high-entropy alloy fabricated by material extrusion additive manufacturing, *Materials Science and Engineering: A* (2025) 148579
 52. Arif Hussain, Junghoon Lee, **Rae Eon Kim**, Hyoung Seop Kim, Jeonghong Ha, Young Sam Kwon, Dongsik Kim, Fabrication of Robust High-Aspect-Ratio Ti-6Al-4V Ultra-Thin-Walled Structures using Powder Bed Fusion with in-situ Focused Infrared Heating, *Additive Manufacturing*, (2025) 104867
 53. Hyojin Park, Qingfeng Wu, Yoon-Uk Heo, Sun Ig Hong, **Rae Eon Kim**, Do Won Lee, Soung Yeoul Ahn, Zhe Gao, Jae Heung Lee, Hyo Moon Joo, Jongun Moon, Young-Sang Na, Jae-il Jang, Hyoung Seop Kim, Manipulating grain boundary migration to fabricate integral core-shell structure with enhanced strain hardening in Ni-based high-entropy alloy, *Journal of Materials Science & Technology* 242 (2026) 213–225
 54. Hyojin Park, Sujung Son, Soung Yeoul Ahn, Hyeonseok Kwon, **Rae Eon Kim**, Jae Heung Lee, Hyo Moon Joo, Jung Gi Kim, Hyoung Seop Kim, Hyperadaptor: Temperature-insensitive tensile properties of Ni-based high-entropy alloy a wide temperature range, *Materials Research Letters* 13 (2025) 348–356
 55. Jaehun Kim, Yeon Taek Choi, **Rae Eon Kim**, Gang Hee Gu, Jihye Kwon, Jung Gi Kim, Min Hong Seo, Hyoung Seop Kim, Distinct wrinkling behavior of metal-polymer-metal sandwich in the forming process: Total sheet wrinkling and surface wrinkling, *Engineering Failure Analysis* 181 (2025) 109918
 56. Junghoon Lee, Arif Hussain, **Rae Eon Kim**, Xingyi Li, Young Sam Kwon, Duo Liu, Hyung Seop Kim, Dongsik Kim, Optimization of laser powder bed fusion process to enhance mechanical properties of as-built Ti-6Al-4V samples, *Journal of Materials Research and Technology* 39 (2025) 3901–3914
 57. Sujung Son, Shi Woo Lee, Jungwan Lee, Hyeonseok Kwon, **Rae Eon Kim**, Hyojin Park, Renhao Wu, Sung Bo Lee, Jien-Wei Yeh, Hyoung Seop Kim, Compositional design and synergistic deformation mechanisms of a lightweight Ti-Al-V-Cr-Zr-Mo medium-entropy alloy, *Acta Materialia* 301 (2025) 121592
 58. Jalal Kangazian, Soung Yeoul Ahn, Shiwoo Lee, Hyeonseok Kwon, **Rae Eon Kim**, Jaehun Kim, Ahmad Kermanpur, Morteza Shamanian, Hyoung Seop Kim, Cryogenic deformation mechanisms in LPBF Hastelloy X: Effects of scanning strategy and post-heat treatment, *Materials Science and Engineering: A* 945 (2025) 148978
 59. Hong Bian, Nan Jiang, Xiaoguo Song, Renhao Wu, Qingfeng Wu, Hyeonseok Kwon, **Rae Eon Kim**, Hyoung Seop Kim, Micro/nano scale Laves phases enhanced hydrogen

- trapping in as-cast high entropy alloy for hydrogen storage applications, *Materials Science and Engineering: A* 945 (2025) 149003
60. Shi Woo Lee, Hyojin Park, **Rae Eon Kim**, Jaehun Kim, Do Won Lee, Jae Heung Lee, Sun Ig Hong, Hyo-Sun Jang, Yoon-Uk Heo, Hyoung Seop Kim, Spinodal-assisted multiscale immiscibility enables superior strength-ductility synergy in (CuFeMnNi)₉₆Al₂Ti₂ high-entropy alloy, *Materials Science and Engineering: A* 951 (2026) 149582
61. Jae Heung Lee, Hyeonseok Kwon, **Rae Eon Kim**, Hyojin Park, Hyoung Seop Kim, Heterostructuring in L12-strengthened high-entropy alloys: controlling continuous-to-discontinuous precipitation ratio to improve tensile properties, *Materials Research Letters* 14 (2026) 322–330
62. Nithin Joseph Reddy Sagili Arthur, **Rae Eon Kim**, Ana Martins, Hyoung Seop Kim, N Schell, João Pedro Oliveira, Gas tungsten arc welding of NiTi shape memory alloy and AlCoCrFeNi_{2.1} eutectic high entropy alloy using a niobium interlayer, *Intermetallics* 191 (2026) 109177
63. Nithin Joseph Reddy Sagili Arthur, **Rae Eon Kim**, Ana Martins, Hyoung Seop Kim, N Schell, João Pedro Oliveira, Dissimilar fusion welding of NiTi shape memory alloy and AlCoCrFeNi_{2.1} eutectic high entropy alloy using multi-interlayer strategy, *Materials Characterization* 235 (2026) 116267