Curriculum Vitae

Prof. Dr. Changsoon Cho

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Education

Ph.D. in Graduate School of EEWS, KAIST (2017/02/17) *(EEWS: Energy, Environment, Water, and Sustainability)*
M.S. in Graduate School of EEWS, KAIST (2013/02/22)
B.S. in Electrical Engineering, KAIST (*Summa Cum Laude*, 2011/02/11)

Work Experience

• Assistant Professor, Department of Materials Science & Engineering, POSTECH (2023/04/16 - present)
• Postdoc Research Fellow, Cavendish Laboratory, University of Cambridge, UK (2021/02/01 – 2023/03/28)
• Humboldt Postdoc Research Fellow, IAPP, Technische Universität Dresden, Germany (2019/05/01 – 2021/01/31)
• Research Fellow (visiting), Cavendish Laboratory, University of Cambridge, UK (2018/05/01 – 2019/04/30)
• Postdoc Research Fellow, KAIST, Korea (2017/03/01 – 2019/04/30)

Track Records

1. Journal Publications

**: corresponding author; †: co-first author*

[45] Yuqi Sun, Lishuang Ge, Linjie Dai, Changsoon Cho, Jordi Ferrer Orri, Kangyu Ji, Szymon J. Zelewski, Yun Liu, Alessandro J. Mirabelli, Youcheng Zhang, Jun-Yu Huang, Yusong Wang, Ke Gong, May Ching Lai, Lu Zhang, Dan Yang, Jiudong Lin, Elizabeth M. Tennyson, Caterina Ducati, Samuel D. Stranks, Lin-Song Cui*, Neil C. Greenham*, "Bright and stable perovskite light-emitting diodes in the near-infrared range," Nature, 615, 830 (2023)

[44] Changsoon Cho, Sascha Feldmann, Kyung Mun Yeom, Yeoun-Woo Jang, Simon Kahmann, Jun-Yu Huang, Terry Chien-Jen Yang, Mohammed Nabaz Taher Khayyat, Yuh-Renn Wu, Mansoo Choi, Jun Hong Noh, Samuel D. Stranks, Neil C. Greenham*, "Efficient Vertical Charge Transport in Polycrystalline Halide Perovskites Revealed by Four-Dimensional Tracking of Charge Carriers," Nature Materials 21, 1388 (2022)

[43] Joo Sung Kim, Jung-Min Heo, Gyeong-Su Park, Seung-Je Woo, Changsoon Cho, Hyung Joong Yun, Dong-Hyeok Kim, Jinwoo Park, Seung-Chul Lee, Sang-Hwan Park, Eojin Yoon, Neil C. Greenham, Tae-Woo Lee, "Ultra-bright, Efficient and Stable Perovskite Light-Emitting Diodes," Nature 611, 688 (2022)

[42] Tobias Antrack, Martin Kroll, Markas Sudzius, Changsoon Cho, Paulius Imbrasas, Miguel Albaladejo-Siguan, Johannes Benduhn, Lena Merten, Alexander Hinderhofer, Frank Schreiber, Sebastian Reineke, Yana Vaynzof, Karl Leo, "Optical Properties of Perovskite-Organic Multiple Quantum Wells," Advanced Science 9, 22003793 (2022)

[41] Changsoon Cho*, Yeoun-Woo Jang, Seungmin Lee, Yana Vaynzof, Mansoo Choi, Jun Hong Noh*, Karl Leo*, "Effects of Photon Recycling and Scattering in High-Performance Perovskite Solar Cells," Science Advances 7, eabj1363 (2021)

[40] Matteo Degani, Qingzhi An, Miguel Albaladejo-Siguan, Yvonne J. Hofstetter, Changsoon Cho, Fabian Paulus, Giulia Grancini, Yana Vaynzof, "23.7% Efficient Inverted Perovskite Solar Cells by Dual Interfacial Modification," Science Advances 7, eabj7930 (2021)

[39] Alexander Palatnik*†, Changsoon Cho† (equal 1st), Chonghe Zhang, Markas Sudzius, Martin Kroll, Stefan Meister, Karl Leo*, "Control of Emission Characteristics of Perovskite Lasers through Optical Feedback," Advanced Photonics Research 2 (12), 2100177 (2021)

[38] Changsoon Cho*, Tobias Antrack, Martin Kroll, Qingzhi An, Toni Robert Bärschneider, Axel Fischer, Stefan Meister, Yana Vaynzof, Karl Leo*, "Electrical Pumping of Perovskite Diodes: Toward Stimulated Emission," Advanced Science 8 (17), 2101663 (2021)

[37] Qingzhi An, Fabian Paulus, David Becker-Koch, Changsoon Cho, Qing Sun, Andreas Weu, Sapir Bitton, Nir Tessler, Yana Vaynzof, "Small grains as recombination hot spots in perovskite solar cells," Matter 4 (5), 1683-1701 (2021)

[36] Changsoon Cho* and Neil C. Greenham*, "Computational Study of Dipole Radiation in Re-Absorbing Perovskite Semiconductors for Optoelectronics," Advanced Science 8 (4), 2003559 (2021)

[35] Hwan-Jin Choi, Changsoon Cho, Sangwon Woo, Jung-Yong Lee, Yeong-Eun Yoo, Minwoo Jeon, Geon-Hee Kim, Tae-Jin Je, Eun-chae Jeon, "Manufacturing of Compound Parabolic Concentrator

Devices Using an Ultra-fine Planing Method for Enhancing Efficiency of a Solar Cell," International Journal of Precision Engineering and Manufacturing-Green Technology (2020)

[34] Changsoon Cho†*, Alexander Palatnik†, Markas Sudzius, Raphael Grodofzig, Frederik Nehm, Karl Leo*, "Controlling and Optimizing Amplified Spontaneous Emission in Perovskites," ACS Applied Materials & Interfaces 12 (31), 35242-35249 (2020)

[33] Ki-Won Seo†, Changsoon Cho† (equal 1st), Hyun-Ik Jang, Jae Hong Park, Jung-Yong Lee*, "Enhanced bendability of nanostructured metal electrodes: effect of nanoholes and their arrangement," Nanoscale 12, 12898-12908 (2020)

[32] Ran Ji, Zongbao Zhang, Changsoon Cho, Qingzhi An, Fabian Paulus, Martin Kroll, Markus Löffler, Frederik Nehm, Bernd Rellinghaus, Karl Leo, Yana Vaynzof, "Thermally evaporated methylammonium-free perovskite solar cells," Journal of Materials Chemistry C 8, 7725-7733 (2020)

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[30] Jooyoung Sung, Christoph Schnedermann, Limeng Ni, Aditya Sadhanala, Richard YS Chen, Changsoon Cho, Lee Priest, Jong Min Lim, Hyun-Kyung Kim, Bartomeu Monserrat, Philipp Kukura, Akshay Rao, "Long-range ballistic propagation of carriers in methylammonium lead iodide perovskite thin films," Nature Physics 16 (2), 171-176 (2020)

[29] Changsoon Cho, Kibok Nam, Ga-Yeong Kim, Yeong Hwan Seo, Tae Gyu Hwang, Ji-Won Seo, Jae Pil Kim, Jong-In Han*, Jung-Yong Lee*, "Multi-bandgap Solar energy conversion via combination of Microalgal photosynthesis and Spectrally Selective photovoltaic cell," Scientific reports 9 (1), 1-10 (2019)

[28] Jiangbin Zhang, Moritz H Futscher, Vincent Lami, Felix U Kosasih, Changsoon Cho, Qinying Gu, Aditya Sadhanala, Andrew J Pearson, Bin Kan, Giorgio Divitini, Xiangjian Wan, Dan Credgington, Neil C Greenham, Yongsheng Chen, Caterina Ducati, Bruno Ehrler, Yana Vaynzof, Richard H Friend, Artem A Bakulin, "Sequentially deposited versus conventional nonfullerene organic solar cells: interfacial trap states, vertical stratification, and exciton dissociation," Advanced Energy Materials 9 (47), 1902145 (2019)

[27] Ki-Won Seo, Jaemin Lee, Jihwan Jo, Changsoon Cho, Jung-Yong Lee, "Highly efficient (> 10%) flexible organic solar cells on PEDOT-free and ITO-free transparent electrodes," Advanced Materials 31 (36), 1902447 (2019)

[26] Changsoon Cho, Kibok Nam, Yeong Hwan Seo, Kyoohyun Kim, YongKeun Park, Jong-In Han*, and Jung-Yong Lee*, "Study of Optical Configurations for Multiple Enhancement of Microalgal Biomass Production," Scientific Reports, 9, 1723 (2019)

[25] Ji-Won Seo, Jong Hun Kim, Mincheol Kim, Seon-Mi Jin, Sang-Hoon Lee, Changsoon Cho, Eunji Lee, Seunghyup Yoo, Jeong Young Park, Jung-Yong Lee, "Columnar-structured Low-concentration Donor molecules in Bulk Heterojunction Organic Solar Cells," ACS Omega, 3, 929 (2018)

[24] Sung Yoon Min, Changsoon Cho, Gi Woong Shim, Ick-Joon Park, Dae Yool Jung, Youngjun Woo, Jung-Yong Lee, and Sung-Yool Choi, "Two-dimensional sheet resistance model for polycrystalline graphene with overlapped grain boundaries," FlatChem, 7, 19 (2018)

[23] Changsoon Cho, Jung Hoon Song, Changjo Kim, Sohee Jeong, and Jung-Yong Lee*, "Broadband light trapping strategies for quantum-dot photovoltaic cells (>10%) and their issues with the measurement of photovoltaic characteristics," Scientific Reports, 7, 17393 (2017)

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[16] Juhoon Kang, Chang-Goo Park, Su-Han Lee, Changsoon Cho, Dae-Geun Choi, and Jung-Yong Lee, "Fabrication of high aspect ratio nanogrid transparent electrodes via capillary assembly of Ag nanoparticles," Nanoscale, 8, 11217 (2016)

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[13] Juhoon Kang†, Changsoon Cho† (equal 1st), and Jung-Yong Lee*, "Design of asymmetrically textured structure for efficient light trapping in building integrated photovoltaics," Organic electronics, 26, 61-65 (2015)

[12] Ali Canlier, Umit Volkan Ucak, Hakan Usta, Changsoon Cho, Jung-Yong Lee, Unal Senc, Murat Citird, "Development of highly transparent Pd-coated Ag nanowire electrode for display and catalysis applications," Applied Surface Science, 350, 79 (2015)

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[10] Jeesoo Seok, Tae Joo Shin, Sungmin Park, Changsoon Cho, Jung-Yong Lee, Du Yeol Ryu, Myung Hwa Kim, and Kyungkon Kim, "Efficient Organic Photovoltaics Utilizing Nanoscale Heterojunctions in Sequentially Deposited Polymer/fullerene Bilayer," Scientific Reports, 5, 8373 (2015)

[9] Myungkwan Song, Han-Jung Kim, Chang Su Kim, Jun-Ho Jeong, Changsoon Cho, Jung-Yong Lee, Sung-Ho Jin, Dae-Geun Choi, and Dong-Ho Kim, "ITO-free highly bendable and efficient organic solar cells with Ag nanomesh/ZnO hybrid electrodes," Journal of Materials Chemistry A, 3, 65-70 (2015)

[8] Yeong Hwan Seo, Changsoon Cho, Jung-Yong Lee, Jong-In Han, "Enhancement of growth and lipid production from microalgae using fluorescent paint under the solar radiation," Bioresource Technology, 173, 193-197 (2014)

[7] Taegeon Kim, Ali Canlier, Changsoon Cho, Vepa Rozyyev, Jung-Yong Lee, Seung Min Han, "Highly Transparent Au coated Ag Nanowire Transparent Electrode with Reduction in Haze," ACS Applied Materials & Interfaces, 6, 13527-13534 (2014)

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[5] Cheng Jin An, Hae-Wook Yoo, Changsoon Cho, Jong-Min Park, Jong Kil Choi, Ming Liang Jin, Jung-Yong Lee, and Hee-Tae Jung, "Surface Plasmon Assisted High Performance Top-Illuminated Polymer Solar Cells with Nanostructured Ag Rear Electrodes," Journal of Materials Chemistry A, 2, 2915-2921 (2014)

[4] Cheng Jin An, Changsoon Cho, Jong Kil Choi, Jong-Min Park, Ming Liang Jin, Jung-Yong Lee, Hee-Tae Jung, "Highly Efficient Top-Illuminated Flexible Polymer Solar Cells with a Nanopatterned 3-Dimensional Microresonant Cavity," Small, 10, 7, 1278–1283 (2014)

[3] Changsoon Cho†, Hoyeon Kim†, Seonju Jeong, Se-Woong Baek, Ji-Won Seo, Donggeon Han, Kyoohyun Kim, YongKeun Park, Seunghyup Yoo*, and Jung-Yong Lee*, "Random and V-groove texturing for efficient light trapping in organic photovoltaic cells," Solar Energy Materials and Solar Cells, 115, 36-41 (2013)

[2] Changsoon Cho and Jung-Yong Lee*, “Multi-scale and angular analysis of ray-optical light trapping schemes in thin-film solar cells: Micro lens array, V-shaped configuration, and double parabolic trapper,” Optics Express, 21, S2, A276–A284 (2013)

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2. Conference Proceedings

•H. J. Choi, E. c. Jeon, S. W. Woo, C. S. Cho, C. E. Kim, T. J. Je, J. Y. Lee, B. S. Shin, “Study on High-Aspect Ratio Parabolic Patterns Machining Using Planing,” Proceedings of KSPE 2014 Spring Conference, Jeju, Korea

•S YOO, D HAN, H KIM, C CHO, JY LEE, “Light management toward efficient organic solar cells,” Renewable Energy and the Environment (Optical Instrumentation for Energy and Environmental Applications), 2013, Tuscon, AZ., US

•Hyung-Man Lee, Chang-Soon Cho, Ju-Hoon Kang, Seok-Hwan Moon, Chang-Wan Byeon, Hun-Gwang Lim, Kun-Sik Ahn, and Jung-Yong Lee “Optical design and characterization of Fresnel lens for concentrated photovoltaic manufacturing,” ICMTE 2012, Seoul, Korea

3. Patents

• “Shape-transformable compound parabolic solar concentrator,” 2020-07-10, Jung-Yong Lee, Changsoon Cho, Korea, Grant No. 10-2132523

• “Four-terminal Multi-junction Photovoltaic Cell using Optical Microstructure,” 2020-03-31, Jung-Yong Lee, Changsoon Cho, Korea, Grant No. 10-2095100

• “Lossless Photovoltaic System using Patterned Array and Method of Manufacturing thereof,” 2019-05-10, Jung-Yong Lee, Changsoon Cho, Korea, Grant No. 10-1976918

• “Hybrid solar energy conversion technology for the simultaneous production of electricity and biofuel,” 2017-07-24, Jung-Yong Lee, Changsoon Cho, Korea, Grant No. 10-1761063

• “Organic thin-film photovoltaic cell using transparent texturing film,” 2014-06-16, Jung-Yong Lee, Seunghyup Yoo, Hoyeon Kim, Changsoon Cho, Juhoon Kang, Korea, Grant No. 10-1406882

• “One body light trapping apparatus having concentrator for increasing power conversion efficiency of photovoltaic cells,” 2013-07-16, Jung-Yong Lee, Changsoon Cho, Korea, Grant No. 10-1283912