

Zebing LIAO

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Department of Electronic and Computer Engineering

Education

9/2021 – present **Ph.D.** **Electronic and Computer Engineering**

Hong Kong University of Science and Technology (HKUST), Hong Kong

- State Key Laboratory of Displays and Optoelectronics
- Major Courses: Advanced Display Technologies, Semiconductor Materials and Devices, Nanoelectronics Materials for Energy Technologies, Machine Learning, Solid State and Semiconductor Electronics

9/2018 – 7/2020 **Master** **Optics engineering, School of semiconductor**

South China Normal University (SCNU), China

- Relevant Courses: Semiconductor physics, Nanostructure physics, Materials Physics and Chemistry, Semiconductor optoelectronics, Materials Surface Engineering Technology

9/2014 – 7/2018 **Bachelor** **Material Science and Engineering**

HuaQiao University, China

- Relevant Courses: Nanostructured materials, Fundamentals of Optoelectronic Technology, Foundation of materials science, Organic chemistry, Physics of materials, Polymer processing, Polymer chemistry and physics

Selected Publications

First author or Co-first author

- **Liao, Z.**, Prodanov, M.F., Kumar, M., Sergeev, A.A., Song, J., Kang, C., Bhadra, D., Wong, K.S., Underwood, I. and Srivastava, A.K., 2025. Inverted Device Engineering for Efficient and Bright Quantum Rod LEDs. *Advanced Materials*, p.e04559.
- **Liao, Z.***, Yu, X.* , Kumar, M., Kang, C., Song, J., Gao, Y., Bhadra, D., Prodanov, M.F., Shah, A., Singh, D.P. and Kumar, S., 2025. Enhanced charge injection in quantum dot light-emitting diodes enabled by discotic liquid crystals. *Journal of Molecular Liquids*, 430, p.127810.
- Zhang, Q*, Zhang, D.* , **Liao, Z.***, Cao, Y.B., Kumar, M., Poddar, S., Han, J., Hu, Y., Lv, H., Mo, X. and Srivastava, A.K., 2025. Perovskite Light - Emitting Diodes with Quantum Wires and Nanorods. *Advanced Materials*, 37(23), p.2405418.
- **Liao, Z.***, Qiu, L.* , Chen, T., Qian, W., Wang, Y., Yang, S., Sun, T., Yang, G., Srivastava, A.K. and Zhou, H., 2023. A Wet - Fusing Assembly Strategy for Forming Low Dark Current 2D/3D Perovskite X - Ray Detector on a Thin Film Transistor Backplane. *Advanced Materials Technologies*, 8(21), p.2300714.
- **Liao, Z.**, Mallem, K., Prodanov, M.F., Kang, C., Gao, Y., Song, J., Vashchenko, V.V. and Srivastava, A.K., 2023. Ultralow roll-off quantum dot light-emitting diodes using engineered carrier injection layer. *Advanced Materials*, 35(47), p.2303950.
- **Liao, Z.***, Xiao, Z.* , Li, Q., Miao, Y., Wei, Y., Gu, H., Jiang, X., Wang, Q. and Li, J., 2020. Manipulating Photon Propagation via a Perovskite Microwire Array. *The Journal of Physical Chemistry C*, 124(44), pp.24315-24321.
- **Liao, Z.**, Xiao, Z., Yang, M., Zhang, M., Zhang, Y., Gu, H., Jiang, X., Wang, Q. and Li, J., 2019. Direct imaging of carrier diffusion length in organic-inorganic perovskites. *Applied Physics Letters*, 115(24).

Co-author

- Prodanov, M.F., Mallem, K., **Liao, Z.**, Bhadra, D., Song, J., Sun, M., Kang, C., Vashchenko, V.V. and Srivastava, A.K., 2025. Highly Efficient and Stable Green Quantum Rod LEDs Enabled by Material and Charge Injection Engineering. *Advanced Materials*, p.2503476.
- Mallem, K., Prodanov, M.F., **Liao, Z.**, Kang, C., Song, J., Bhadra, D., Gavara, R.R. and Srivastava, A.K., 2025. Quantum rod light emitting diodes: Suppressing leakage current and improving external quantum efficiency. *Nano Research*, 18(1).

- Prodanov, M.F., Song, J., Gao, Y., Kang, C., Bhadra, D., **Liao, Z.**, Mallem, K., Vashchenko, V.V. and Srivastava, A.K., 2025. Photoluminescence Type Color Filters for Efficient Displays with Vibrant Colors. *Advanced Optical Materials*, 13(21), p.2500761.
- Song, J., Prodanov, M.F., Gao, Y., Kang, C., Bhadra, D., Cheng, Y., **Liao, Z.**, Mallem, K., Swaminathan, V., Vashchenko, V.V. and Wu, X., 2025. Polarized Color Filters Using Colloidal Quantum Rod Nanocrystals for Advanced High-Performance Displays. *Advanced Science*, p.2414316.
- Kang, C., Prodanov, M.F., Song, J., Mallem, K., **Liao, Z.**, Vashchenko, V.V. and Srivastava, A.K., 2024. Robust, Narrow-Band Nanorods LEDs with Luminous Efficacy > 200 lm/W: Next-Generation of Efficient Solid-State Lighting. *Small*, 20(45), p.2311671.

Conference papers

- **Liao, Z.**, Prodanov, M.F., Kumar, M., Sun, M., Underwood, I. and Srivastava, A.K., 2025, June. 57-3: Identifying the Key Issues in Inferior Performance of Quantum Rod LEDs. In *SID Symposium Digest of Technical Papers* (Vol. 56, No. 1, pp. 771-773).
- **Liao, Z.**, Prodanov, M.F., Mallem, K., Kang, C., Song, J., Bhadra, D. and Srivastava, A.K., 2024, June. 44-3: High Efficiency and Brightness Quantum Rods Light Emitting Diode. In *SID Symposium Digest of Technical Papers* (Vol. 55, No. 1, pp. 585-587).
- **Liao, Z.**, Mallem, K., Prodanov, M.F., Kang, C., Gao, Y., Song, J., Vashchenko, V.V. and Srivastava, A.K., 2023, June. P-132: Carriers Transport Dynamics in Quantum-Dot Light-Emitting Diode by Transient Electroluminescence Analysis. In *SID Symposium Digest of Technical Papers* (Vol. 54, No. 1, pp. 1358-1361).
- Mallem, K., **Liao, Z.**, Prodanov, M.F., Sun, M., Song, J., Bhadra, D. and Srivastava, A.K., 2025, June. 5-3: Distinguished Student Paper: Highly Efficient and Bright Green Quantum-Rod Light-Emitting Diodes with Eliminated Charge Leakage. In *SID Symposium Digest of Technical Papers* (Vol. 56, No. 1, pp. 36-39).

Selected Academic Conferences

- Poster, The 22nd International Meeting on Information Display, 2022 (Bexco, Busan, Korea)
- Poster, Society for Information Display (SID) Display Week 2023 Symposium (Los Angeles, CA, United States)
- Best Poster, Nanomaterials and Their applications in Display and Photonics (NanoDisp) (HKUST, Hong Kong, China)
- Oral Presentation, Society for Information Display (SID) Display Week 2024 Symposium (San Jose, CA, United States)
- Oral Presentation, Society for Information Display (SID) Display Week 2025 Symposium (San Jose, CA, United States)

Selected Project Experience

Fabrication and characterization of photo-aligned molecular motor/columnar mesogens based multifunctional devices for plastic electronics. (France / Hong Kong Joint Scheme) 1/2021–12/2023

Developed a new type of liquid crystal-based materials utilized for the hole transport layer of QLED.

Integrating high brightness QD-LED for active matrix driven / passive matrix driven micro-LED. (Company) 4/2023–present

Transitioned device structure from bottom-emission to top-emission without performance compromise; optimized device parameters to maximize outcoupling efficiency; integrated QLED devices into micro-LED display panels.

Developing high brightness and highly efficient QD-LED for AR/VR 4/2023–present

Investigated factors contributing to low efficiency at high brightness; proposed and implemented structural modifications to enhance performance

Selected Honors and Awards

Second Prize

2025 ICDT New Display Technology Competition

First Prize

2023 China Star Scientific Research Vlog Competition