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Professor

B.S. in Chemical Engineering
National Taiwan University, 1983
M.S. in Inorganic Materials
Tokyo Institute of Technology, 1988
Dr.Eng. in Inorganic Materials
Tokyo Institute of Technology, 1991

Research and Professional Interests
Nano-sized electroceramic particles
Electro-optical materials
Phosphors for LED
Solar-Cell Materials and Thin Films
Reaction kinetics and modeling

Journal Papers

1. Che-Yuan Yang, Sudipta Som, Subrata Das, and **Chung-Hsin Lu**, "Synthesis of $\text{Sr}_2\text{Si}_5\text{N}_8:\text{Ce}^{3+}$ Phosphors for White LEDs via Efficient Chemical Vapor Deposition," *Scientific Reports* 7, 45832 (2017)
2. Che-Yuan Yang, Sudipta Som, Subrata Das, and **Chung-Hsin Lu**, "Photoluminescence and Cathodoluminescence Properties of Green-red Emitting $\text{ZnGd}_4\text{Si}_3\text{O}_{13}:\text{Tb}^{3+}, \text{Mn}^{2+}$ Phosphors," *Journal of Materials Science-Materials in Electronics* 28, 9174 (2017).
3. Jen-Cheng Sung, and **Chung-Hsin Lu**, "Effects of Sputtering Conditions on the Photovoltaic Properties of Al-doped Zinc Oxide Films for $\text{Cu}(\text{In,Ga})\text{Se}_2$ Thin-film Solar Cells", *Journal of Materials Science-Materials in Electronics*, 28, 15442 (2017).
4. Heng-Yu Liu, Sudipta Som, Jen-Cheng Sung, Chang-Ying Ou, Che-Yuan Yang, and **Chung-Hsin Lu**, "Effects of Ammonia Concentration on the Formation of CdS Fabricated via Microwave-assisted Chemical Bath Deposition," *Journal of the American Ceramic Society*, 100, 5120 (2017).
5. Jen-Cheng Sung, and **Chung-Hsin Lu**, "Potassium-ion Doped $\text{Cu}(\text{In,Ga})\text{Se}_2$ Thin Films Solar Cells: Phase formation, Microstructures, and Photovoltaic Characteristics," *Applied Surface Science* 409, 270 (2017).
6. Guan-Lin Chiu, T. Subburaj, Sudipta Som, Chang-Ying Ou, and **Chung-Hsin Lu**, "Influence of Doping Iron Ions into $\text{Cu}(\text{In,Ga})\text{Se}_2$ Films in the Morphology and Photovoltaic Properties of Thin-film Solar Cells", *Journal of Ceramics Processing Research*, 18, 754 (2017).
7. **Chung-Hsin Lu**, Che-Yuan Yang, Sudipta Som, Subrata Das, "Facile Synthesis and Spectroscopic Characterization of Siliconitride Phosphors for White Light-Emitting Diodes," *Journal of the American Ceramic Society*, 101, 4916 (2018).
8. Anil Kumar Pal, Sudipta Som, **Chung-Hsin Lu**, "Synthesis and Spectroscopic Analysis of Sm^{3+} Doped CeO_2 Ceramic Powders for The Application of White LEDs," *Ceramics International*, 44, 18256 (2018).
9. **Chung-Hsin Lu**, Guan-Lin Chiu, Sudipta Som, Chang-Ying Ou, "Influence of Selenization Temperatures on the Microstructures and Photoelectric Properties of Iron-ion Doped $\text{Cu}(\text{In,Ga})\text{Se}_2$ Thin-Film Solar Cells," *Vacuum*, 156, 212 (2018).
10. Yong-Jian Liu, Chang-Ying Ou, **Chung-Hsin Lu**, "Effects of Mo Films Prepared via Different Sputtering Conditions on the Formation of MoSe_2 During Selenization,"

Journal of Alloys and Compounds, 747, 621 (2018).

11. Chung-Hsien Wu, Fu-Shan Chen, Shin-Hom Lin, Chang-Ying Ou, **Chung-Hsin Lu**, "Effects of Various Grading Types of Gallium-ion Contents on The Properties of Cu(In,Ga)Se₂ Films Prepared via the Spin Coating Method," *Materials Research Express*, 5, 025516 (2018).
12. Hua-Tai Lu, Chang-Ying Ou, **Chung-Hsin Lu**, "(Ag,Cu)(In,Ga)Se₂ Thin Films Fabricated on Flexible Substrates via Non-Vacuum Process," *Journal of Materials Science: Materials in Electronics*, 29, 1614 (2018).
13. Ming-Ching Chen, Jen-Cheng Sung, Chang-Ying Ou, Suditpa Som, **Chung-Hsin Lu**, "Fast Formation of CdS Thin Films Prepared via The Microwave-Assisted Chemical Bath Deposition Process," *Thin Solid Films*, 645, 64 (2018).
14. Subrata Das, Sudipta Som, Che-Yuan Yang, **Chung-Hsin Lu**, "Optical Temperature Sensing Properties of SnO₂ : Eu³⁺ Microspheres Prepared via The Microwave Assisted Solvothermal Process," *Materials Research Bulletin*, 97, 101 (2018).
15. **Chung-Hsin Lu**, Wen Yuan Li, T. Subburaj, Chang Ying Ou, P. Senthil Kumar, "Influence of Bio-derived Agar Addition on the Electrochemical Performance of LiFePO₄ Cathode Powders for Li-ion batteries," *Ceramics International*, 45, 12218 (2019).
16. **Chung-Hsin Lu**, Shin-Hom Lin, "Microstructures and Photovoltaic Performances of Bismuth- ion Doped Cu(In,Ga)Se₂ Films Prepared via Sputtering Process," *Journal of the American Ceramic Society*, 102, 3578 (2019).
17. Sudipta Som, Peng-Hsuan Kuo, **Chung-Hsin Lu**, "Facile Synthesis of Eu²⁺ Activated Dual Light Emitting Barium Silicate Phosphors for Warm-White Light Emitting Diodes," *Journal of Alloys and Compounds*, 790, 1060 (2019).
18. Sudipta Som, Che-Yuan Yang, **Chung-Hsin Lu**, Subrata Das, "Synthesis of Li⁺-ion Activated NaYF₄: Er³⁺/Yb³⁺ Phosphors via A Modified Solid-state Process for Latent Fingerprint Detection," *Ceramics International* 45, 5703 (2019).
19. **Chung-Hsin Lu**, N. Naresh, Senthil Kumar, Sudipta Som, "Microwave- Assisted Solvothermal Synthesis and Electrochemical Characterizations of Ternary Perovskite NiTiO₃ Anode Materials for Lithium-ion Batteries," *Ceramics International* 45, 19517 (2019).
20. Madhav P. Chavhan, Sudipta Som, **Chung-Hsin Lu**, "Size-controlled Ceria Nanocubes Obtained via Hydrothermal Route for Electrochemical Capacitors," *Materials Letters* 257, 126598 (2019).
21. **Chung-Hsin Lu**, Guan-Rong Chen, Mei-Tsan Kuo, "Effects of Precursor Composition on Morphology and Microstructure of Hybrid Organic-Inorganic Perovskite Solar Cells," *Journal of Materials Science* 54,12758 (2019).
22. Madhav P. Chavhan, Sudipta Som, **Chung-Hsin Lu**, "Size-controlled Ceria Nanocubes Obtained via Hydrothermal Route for Electrochemical Capacitors," *Materials Letters* 257, 126598 (2019). 1. Madhav P Chavhan, Chung-Hsin Lu, Sudipta Som "Urea and surfactant assisted hydrothermal growth of ceria nanoparticles," *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 601, 124944 (2020).

23. **Chung-Hsin Lu**, Pranav Kulkarni, S Balaji, P Senthil Kumar "Exploration of electrochemical and lithium transport properties of BaNb₃ 6O₁₀ as an anode material for lithium-ion batteries," *Journal of Alloys and Compounds* 830, 154306 (2020).
24. **Chung-Hsin Lu**, Jen-Cheng Sung, Chang-Ying Ou, Rajan Kumar Singh "Solution-processed Cu (In, Ga)(Se, S) 2 solar cells prepared via a surface sulfurization process," *Journal of the Taiwan Institute of Chemical Engineers* 110, 41-50 (2020).
25. **Chung-Hsin Lu**, Che-Yuan Yang, Sudipta Som, Subrata Das "Structural and luminescence characterization of terbium doped siliconitride phosphors for afterglow applications," *Optik* 203, 164030 (2020).
26. **Chung-Hsin Lu**, Chun-Hung Yeh, Sudipta Som "Synthesis of Tb³⁺-Yb³⁺ coactivated CeO₂ phosphors for two-photon assisted quantum cutting applications," *Chemical Physics Letters* 748, 137383 (2020).
27. Mohan Lal Meena, Sudipta Som, Rajan Kumar Singh, **Chung-Hsin Lu** "Synthesis, spectroscopic characterization and estimation of Judd-Ofelt parameters for Dy³⁺ activated Li₂MgZrO₄ double perovskite materials," *Polyhedron* 177, 114322 (2020).
28. Chang-Ying Ou, Sudipta Som, **Chung-Hsin Lu** "Incorporation of copper-indium back-end layers in the solution-based Cu (In, Ga) Se₂ films: enhancement of photovoltaic performance of fabricated solar cells," *Materials Research Express* 7, 026409 (2020).
29. Rajan Kumar Singh, Sudipta Som, Somrita Dutta, Neha Jain, Jai Singh, Ranveer Kumar, **Chung-Hsin Lu** "Rapid and room temperature synthesis of MAPb_{1-x}Sn_xBr_{3-2x}Cl_{2x} perovskite quantum dots with enhanced lifetime in warm WLEDs: A step towards environmental friendly perovskite light harvester," *Chemical Engineering Journal* 391, 123629 (2020).
30. Rajan Kumar Singh, Sudipta Som, **Chung-Hsin Lu** "Spectroscopic investigation of red Eu³⁺ doped ceria nanophosphors and promising color rendition for warm white LEDs," *Journal of Alloys and Compounds* 816, 152653 (2020).
31. Karan Kumar Gupta, Sudipta Som, **Chung-Hsin Lu**, "Synthesis and spectroscopic characterization of strontium magnesium silicate phosphors for white afterglow applications", *Optik* 226, 165916, (2021).
32. **Chung-Hsin Lu**, Kuo-Chen Li, S Balaji, P Senthil Kumar, "Agar-assisted sol-gel synthesis and electrochemical characterization of TiNb₂O₇ anode materials for lithium-ion batteries", *Ceramics International* 47, 18619-18624, (2021).
33. **Chung-Hsin Lu**, Yi-Hsin Liu, Mohan Lal Meena, Sudipta Som, "Synthesis and spectroscopic characterization of CsPbBr₃/Cs₄PbBr₆ perovskites synthesized via the microwave-assisted heating process for backlight display devices", *Organic Electronics* 91, 106079, (2021).
34. Chang-Ying Ou, Sudipta Som, **Chung-Hsin Lu**, Karan Kumar Gupta, Rajneesh Chaurasiya, "Photovoltaic characteristics and computational simulation of samarium-ion doped Cu (In, Ga) Se₂ thin films prepared via a non-vacuum coating process", *Journal of Alloys and Compounds* 881, 160377, (2021).
35. Singh, Rajan Kumar; Sharma, Pushkal; Kumar, Ranveer; Som, Sudipta; Dutta, Somrita;

- Jain, Neha; Chaurasiya, Rajneesh; Meena, Mohan Lal; Ho, Jian-Syun; Dai, Shu-Wen; Singh, Jai; **Lu, Chung-Hsin**; Lin, Hao-Wu, "CH₃NH₃Pb_{1-x}CoxBr_{3-2x}Cl_{2x} Perovskite Quantum Dots for Wide-Color Backlighting", *ACS Applied Nano Materials*, 4, 717-728, (2021).
36. Rajan Kumar Singh, Pushkal Sharma, **Chung-Hsin Lu**, Ranveer Kumar, Neha Jain, Jai Singh, "Structural, morphological and thermodynamic parameters investigation of tunable MAPb_{1-x}CdxBr_{3-2x}I_{2x} hybrid perovskite", *Journal of Alloys and Compounds* 866, 158936, (2021).
 37. Rajan Kumar Singh, Pushkal Sharma, **Chung-Hsin Lu**, Ranveer Kumar, Sudipta Som, Somrita Dutta, Neha Jain, Mohan Lal Meena, Jai Singh, Teng-Ming Chen, "Incorporation of zinc ions towards low toxicity and high stability of organic-inorganic methyl ammonium lead bromide perovskite QDs via ultrasonication route for white-LEDs", *Journal of Molecular Liquids* 337, 116557, (2021).
 38. Sudipta Som, **Chung-Hsin Lu**, Che-Yuan Yang, Subrata Das, "Synthesis and design of NaYF₄ microprisms via a microwave-assisted approach for highly sensitive optical thermometry applications", *Journal of the American Ceramic Society* 104, 5168-5181, (2021).
 39. **Chung-Hsin Lu**, Chih-Ping Tan, P. Senthil Kumar, S. Balaji, "Urea and PVP Assisted Modified Hydrothermal Synthesis of Spherical LiNi_{0.4}Co_{0.2}Mn_{0.4}O₂ Cathode Materials for Battery Application," *Journal of Alloys and Compounds* 890, 161894, (2022).
 40. **Chung-Hsin Lu**, Peng-Hsuan Kuo, Sudipta Som, "Efficient White Light Emission from a **Single** Silicate Host with Promising Color Quality for White Light Emitting Diodes," *Optik* 251, 168244, (2022).
 41. Mohan Lal Meena, **Chung-Hsin Lu**, Sudipta Som, Rajneesh Chaurasiya, Shawn D. **Lin**, "Highly Efficient and Thermally Stable Eu³⁺ Activated Phosphate Based Phosphors for wLEDs: An Experimental and DFT Study," *Journal of Alloys and Compounds* 895, 162670, (2022).
 42. Rajan Kumar Singh, Li-Hsuan Chen, Anupriya Singh, Neha Jain, Jai Singh, **Chung-Hsin Lu**, "Progress of Backlight Devices: Emergence of Halide Perovskite Quantum Dots/Nanomaterials," *Frontiers in Nanotechnology* 4, 863312, (2022).
 43. **Chung-Hsin Lu**, Rajan Kumar Singh, Ting-Yu Chen, Sudipta Som, Rajesh Kumar, Shao An Lu, Mohan Lal Meena, "Rapid Synthesis and Theoretical Analysis of CH₃NH₃Pb_{1-x}CdxBr₃ Perovskite Quantum Dots for Backlight LEDs: A Step Towards Enhanced Stability," *Organic Electronics* 102, 106444, (2022).
 44. Mohan Lal Meena, Sudipta Som, Rajneesh Chaurasiya, Shawn D. Lin, **Chung-Hsin Lu**, "Spectroscopic, Optical Properties and Ab-initio Calculation of Thermally Stable Na₂Ca_{1-x}P₂O₇:xEu³⁺ Phosphors for wLEDs," *Ceramics International* 48, 20940, (2022).

45. Chieh-Wen Hsieh, Rajan Kumar Singh, Sudipta Som, **Chung-Hsin Lu**, "Detection of Fe (III) Using APTES-coated CsPbBr₃-CsPb₂Br₅ Perovskite Quantum Dots," *Chemical Engineering Journal Advances* 12, 100358, (2022).
46. Yi-Hsin Liu, Rajan Kumar Singh, Shao-An Lu, Sudipta Som, **Chung-Hsin Lu**, "Incorporation of Cesium Ions in FAPbBr₃ Quantum Dots: Spectroscopic Characterization for Light-emitting Application," *Journal of the Taiwan Institute of Chemical Engineers* 139, 104496, (2022).
47. Kai-Hsiang Liang, Karan Kumar Gupta, **Chung-Hsin Lu**, Sudipta Som, "Preparation, Structural, and Characterizations of SnO₂-coated TiNb₂O₇ Anode Materials for Lithium-ion Batteries," *Journal of the American Ceramic Society* 105, 6168, (2022).

Conference Papers

1. Sudipta Som, Subrata Das, Che-Yuan Yang, and **Chung-Hsin Lu**, Li⁺-ion Induced Modification of β-NaYF₄: Er³⁺/Yb³⁺ Phosphors Synthesized via Solid State Reaction for Security Applications, *Asia Pacific Society for Materials Research 2017 Annual Meeting (APSMR)*, 2017.
2. Sudipta Som, Subrata Das, Che-Yuan Yang, and **Chung-Hsin Lu**, Effect of Microwave Assisted Sol-Gel Synthesis Route for the Efficient Orange- Red Light Emission in Eu²⁺ Activated Ca₂Si₅N₈ Phosphors, *International Symposium on Engineering and Applied Science (ISEAS)*, 2017.
3. Sudipta Som, Subrata Das, Che-Yuan Yang, and **Chung-Hsin Lu**, "Synthesis and Photoluminescence Characterization of Eu²⁺ Activated La₆(SrCa)₄(SiO₄)₆F₂ Phosphors for Green Light Emitting Applications," *3rd International Conference on Sciences, Technology and Social Sciences*, 2017.
4. Yen-Han Wang, Peng-Hsuan Kuo, and **Chung-Hsin Lu**, "Effects of Heating Conditions on the Properties of ZnIn₂S₄ Semiconductor Powders," *Annual Meeting of Taiwan Metal Heat-Treatment Society*, 2017.
5. Heng-Yu Liu, Chang-Ying Ou, and **Chung-Hsin Lu**, "Modification of In₂S₃ Semiconductor Thin Films," *Annual Meeting of Taiwan Metal Heat-Treatment Society*, 2017.
6. Kuan-Rong Chen, Mei-Tsan Kuo, and **Chung-Hsin Lu**, "Influence of Heating Treatment on the Perovskite Thin Films," *Annual Meeting of Taiwan Metal Heat-Treatment Society*, 2017.
7. Senthil Kumar Parthasarathia, Chang Ying Oua, Sudipta Soma, **Chung-Hsin Lu**, "Dielectric and Temperature Dependent Conductivity Analysis on Proton Conducting PVP-NH₄PF₆ Polymer Membrane for PEMFC," *The 2018 International Conference on Green Electrochemical Technologies and the 2018 Annual Meeting of Electrochemical Society of Taiwan*, 2018.
8. Chang Ying Ou, Wen Yuan Lia, **Chung-Hsin Lu**, "Preparation of LiFePO₄/C Powders via a Sol-Gel Route," *The 2018 International Conference on Green Electrochemical Technologies and the 2018 Annual Meeting of Electrochemical Society of Taiwan*, 2018.

9. **Chung-Hsin Lu**, "Preparation and Characterization of Phosphors Used in White LED," Kobe University-NTU Jointed Conference, 2018.
10. **Chung-Hsin Lu**, "Non-vacuum Process and Characterization of CIGS Solar Cells," Global Research Efforts on Energy and Nanomaterials (GREEN 2018) 2018. (invited speech).
11. **Chung-Hsin Lu**, Peng-Hsuan Kua, Sudipta Som, "Synthesis and Luminescence Characterizations of Eu²⁺ Activated Barium Silicate Phosphors for Warm-white Light Emitting Diode Applications," 7th Asia Conference on Mechanical and Materials Engineering, Japan (2019).
12. **Chung-Hsin Lu**, Sudipta Som, "Microwave-assisted Synthesis of Silicate Based Phosphors for Long Persistence Applications," World Congress of Advanced Materials, Japan (2019).
13. Rajan Kumar Singh, Sudipta Som, **Chung Hsin Lu**, "Rapid Synthesis of Highly Yellow emissive MAPb_{0.80}Sn_{0.20}I₂Br_{0.40} Perovskite QDs for Color Converter Application," International Electron Devices & Materials Symposium (2019).
14. Rajan Kumar Singh, Sudipta Som, **Chung Hsin Lu**, "Synthesis of CuIn_{1-x}Ce_xSe₂ Nano-particle via Solid State Route: Phase and Morphological Growth study," International Electron Devices & Materials Symposium (2019).
15. **Chung- Hsin Lu**, Sudipta Som, "Advancement of Colloidal Quantum Dots from Phosphors: A step towards Environmentally Benign Light-Emitting Diodes and Backlight Applications," Okinawa Colloids, Japan (2019). (invited speech)
16. **Chung-Hsin Lu**, Jen-Cheng Sung, Chang-Ying Ou, "Solution-Process and Characterizations of Solar Cells," The 21st Takayanagi Kenjiro Memorial Symposium, Japan (2019). (invited speech)
17. Mohan Lal Meena, Sudipta Som, Rajan Kumar Singh, Yi-Hsin Liu, **Chung Hsin Lu**, "Enhanced Stability of Perovskite Quantum Dots Encapsulated in MOF-5," Metal-Organic Frameworks Workshop in Taiwan (MOF Taiwan-2019) (2019).
18. **Chung-Hsin Lu**, "CIGS-based Solar Cell: Thin-Film Preparation," The 1st International Conference on Application of Perovskite Quantum Dots and Energy Materials (2019). (invited speech).
19. **Shao An Lu**, Yi-Hsin Liu, Mohan Lal Meena, Sudipta Som, Chung-Hsin Lu, "Synthesis of CsPbBr₃/Cs₄PbBr₆ Perovskites via a Microwave-assisted Process for Display Application," Society for Interface Science Annual Meeting (2022).
20. Shao An Lu, Sudipta Som, Mohan Lal Meena, Rajan Kumar Singh, Chung-Hsin Lu, "**Synthesis** and Characterization of Cs₂AgBiX₆ (X= I, Br, Cl) Quantum Dots for Color Tunable Light Emitting Materials," Society for Interface Science Annual Meeting (2022).
21. Mohan Lal Meena, Sudipta Som, Shao An Lu, Shawn D. Lin, Chung-Hsin Lu, "Synthesis, Spectroscopic Characterization of Tb³⁺ Doped Li₂MgZrO₄ Double Perovskite Materials," Society for Interface Science Annual Meeting (2022).

Patents

1. 呂宗昕, 89.12.24, “High-Pressure Process for Crystallization of Ceramic Films at Low Temperatures,” U.S.A., (2000~2019)。
2. 呂宗昕, 低溫製備結晶化陶瓷薄膜之高壓製程, 91.12.1, 台灣, (2002~2019).
3. 呂宗昕, 二氧化鈦粉體之製備技術, 92.7.11, 台灣, 中華民國發明第 181853 號 (2003/7/11~2022/6/23).
4. 呂宗昕, 鋰離子二次電池陰極材料之製備, 92.9.11, 發明第 11802 號, 台灣, (2003/9/11~2020/6/18).
5. 「新型光觸媒材料」· 獲頒中華民國發明專利證書 (12/13/2010)

Honors and Others

1. 科技部傑出特約研究員獎 (2019)
2. 科技部特約研究員 (2014-2018)
3. 國立臺灣大學「研發創新傑出獎」(2014)
4. 經濟部「第九屆奈米產業科技菁英獎」(2013)
5. 台灣化學工程學會金開英獎 (2012)
6. 國科會傑出研究獎 (2000, 2002, 2011)