

Dr. Jingdong Luo is the research scientist and subgroup leader of organic electro-optic thrust in Jen research group. Dr. Luo has more than ten years of experience in the field of organic photonics and electronics, and co-authored more than 150 research papers and texts as well as 10 patents on organic functional materials for opto-electronics and photonics. His major scientific achievements include supramolecular engineering of organic nonlinear optical materials for low driven voltage modulators, efficient pyroelectric poling of organic/polymeric dielectric materials, high performance electro-optic polymers for CPU CMOS and silicon photonic platforms, and aggregation induced emission mechanism for OLED and sensing applications.

### Education

7/2000      Ph. D., Department of Chemistry, Wuhan University, Wuhan, Hubei, China.  
7/1992      B. S., Department of Chemistry, Nankai University, Tianjin, China.

### Professional Experience

9/2006 to present      Research scientist, subgroup leader of organic photonics in Prof. Jen's research group, Dept. of Materials Science and Engineering, University of Washington, Seattle.  
7/2001 to 9/2006      Postdoctoral research associate in Prof. Jen's research group, subgroup leader in the research of organic and polymeric electro-optic materials, Dept. of Materials Science and Engineering, University of Washington, Seattle.  
8/2000 to 7/2001      Research Associate, Dept. of Chemistry, Hong Kong University of Science and Technology, Hong Kong.

**Total Publications: 156; Average Citations per Item: 26.31; H-index: 36**

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### Selected Publications:

1. S. Huang, J. Luo, H.-L. Yip, A. Ayazi, X.-H. Zhou, M. Gould, A. Chen, T. Baehr-Jones M. Hochberg, A. K-Y. Jen, "Efficient poling of electro-optic polymers in thin films and silicon slot waveguides by detachable pyroelectric crystals", *Advanced materials*, **2012**, 24(10), OP42-7 (Cover image for opening issue of *Advanced Optical Materials*).
2. X.-H. Zhou, J. Luo, J. A. Davies, S. Huang, A. K-Y. Jen, "Push-pull tetraene chromophores derived from dialkylaminophenyl, tetrahydroquinolinyl and julolidinyl moieties: optimization of second-order optical nonlinearity by fine-tuning the strength of electron-donating groups", *Journal of Materials Chemistry*, **2012**, 22(32), 16390-16398.
3. S. Huang, J. Luo, Z. Jin, X.-H. Zhou, Z. Shi, A. K-Y. Jen, "Enhanced temporal stability of a highly efficient guest-host electro-optic polymer through a barrier layer assisted poling process", *Journal of Materials Chemistry*, **2012**, 22(38), 20353-20357.
4. Z. Shi, Y.-Z. Cui, S. Huang, Z.-A. Li, J. Luo, A. K-Y. Jen, "Dipolar Chromophore Facilitated Huisgen Cross-Linking Reactions for Highly Efficient and Thermally Stable Electrooptic Polymers", *ACS Macro Letters*, **2012**, 1(7), 793-796.
5. B. M. Polishak, S. Huang, J. Luo, Z. Shi, X.-H. Zhou, A. Hsu, and A. K-Y. Jen, "A Triptycene-Containing Chromophore for Improved Temporal Stability of Highly Efficient Guest-Host Electrooptic Polymers", *Macromolecules*, **2011**, 44(6), 1261-1265.

6. J. Luo, S. Huang, Z. Shi, B. M. Polishak, X.-H. Zhou, A. K.-Y. Jen, "Tailored Organic Electro-optic Materials and Their Hybrid Systems for Device Applications", *Chemistry of Materials*, **2011**, 23(3), 544-553.
7. X. Wang, C.-Y. Lin, S. Chakravarty, J. Luo, A. K.-Y. Jen, R. T. Chen, "Effective in-device  $r_{33}$  of 735 pm/V on electro-optic polymer infiltrated silicon photonic crystal slot waveguides", *Optics Letters*, **2011**, 36(6), 882-884.
8. M. Gould, T. Baehr-Jones, R. Ding, S. Huang, J. Luo, A. K.-Y. Jen, J.-M. Fedeli, M. Fournier, M. Hochberg, "Silicon-polymer hybrid slot waveguide ring-resonator modulator", *Optics Express*, **2011**, 19(5), 3952-3961.
9. S. Chadderdon, R. Gibson, R. H. Selfridge, S. M. Schultz, W. C. Wang, R. Forber, J. Luo, A. K.-Y. Jen, "Electric-field sensors utilizing coupling between a D-fiber and an electro-optic polymer slab", *Applied optics*, **2011**, 50(20), 3505-12.
10. S. Huang, T.-D. Kim, J. Luo, S. K. Hau, Z. Shi, X.-H. Zhou, H.-L. Yip and A. K.-Y. Jen, "Highly efficient electro-optic polymers through improved poling using a thin TiO<sub>2</sub>-modified transparent electrode", *Appl. Phys. Lett.* **2010**, 96, 243311-1/3.
11. Z. Shi, W. Liang, J. Luo, S. Huang, B. M. Polishak, X. Li, T. R. Younkin, B. A. Block and A. K.-Y. Jen, "Tuning the Kinetics and Energetics of Diels-Alder Cycloaddition Reactions to Improve Poling Efficiency and Thermal Stability of High-Temperature Cross-Linked Electro-Optic Polymers", *Chemistry of Materials*, **2010**, 22(19), 5601-5608.
12. J. Luo, T.-D. Kim and A. K.-Y. Jen, "Unprecedented electro-optic properties in polymers and dendrimers enabled by click chemistry based on the Diels-Alder reactions", *Click Chemistry for Biotechnology and Materials Science*, **2009**, 379-398.
13. J. Luo, X.-H. Zhou, A. K.-Y. Jen, "Rational molecular design and supramolecular assembly of highly efficient organic electro-optic materials", *Journal of Materials Chemistry*, **2009**, 19(40), 7410-7424.
14. Z. Shi, J. Luo, S. Huang, X.-H. Zhou, T.-D. Kim, Y.-J. Cheng, B. M. Polishak, T. R. Younkin, B. A. Block, A. K.-Y. Jen, "Reinforced Site Isolation Leading to Remarkable Thermal Stability and High Electrooptic Activities in Cross-Linked Nonlinear Optical Dendrimers", *Chemistry of Materials*, **2008**, 20(20), 6372-6377.
15. Y.-J. Cheng, J. Luo, S. Huang, X. Zhou, Z. Shi, T.-D. Kim, D. H. Bale, S. Takahashi, A. Yick, B. M. Polishak, S.-H. Jang, L. R. Dalton, P. J. Reid, W. H. Steier, A. K.-Y. Jen, "Donor-Acceptor Thiolated Polyenic Chromophores Exhibiting Large Optical Nonlinearity and Excellent Photostability", *Chemistry of Materials*, **2008**, 20(15), 5047-5054.
16. T.-D. Kim, J. Luo, Y.-J. Cheng, Z. Shi, S. Hau, S.-H. Jang, X.-H. Zhou, Y. Tian, B. Polishak, S. Huang, H. Ma, L. R. Dalton, A. K.-Y. Jen, "Binary Chromophore Systems in Nonlinear Optical Dendrimers and Polymers for Large Electrooptic Activities", *Journal of Physical Chemistry C*, **2008**, 112(21), 8091-8098.
17. T. Gray, T.-D. Kim, D. B. Jr Knorr, J. Luo, A. K.-Y. Jen, R. M. Overney, "Mesoscale dynamics and cooperativity of networking dendronized nonlinear optical molecular glasses", *Nano letters*, **2008**, 8(2), 754-9.
18. J. Luo, S. Huang, Y.-J. Cheng, T.-D. Kim, Z. Shi, X.-H. Zhou, A. K.-Y. Jen, "Phenyltetraene-Based Nonlinear Optical Chromophores with Enhanced Chemical Stability and Electrooptic Activity", *Organic Letters*, **2007**, 9(22), 4471-4474.
19. Y. Enami, C. T. DeRose, D. Mathine, C. Loychik, C. Greenlee, R. A. Norwood, T. D. Kim, J. Luo, Y. Tian, A. K.-Y. Jen and N. Peyghambarian, "Record Electro-optic Coefficient of

- 170 pm/V and  $V_{\pi}$  of 1V at 1.55  $\mu\text{m}$  in Hybrid Crosslinkable Polymer/Sol-gel Waveguide Modulators”, *Nature Photonics*, **2007**, 1, 180-185 (Cover image for Nature Photonics).
20. T.-D. Kim, J.-W. Kang, J. Luo, S.-H. Jang, J.-W. Ka, N. Tucker, J. B. Benedict, L. R. Dalton, T. Gray, R. M. Overney, D. H. Park, W. N. Herman, A. K-Y. Jen, “Ultralarge and Thermally Stable Electro-Optic Activities from Supramolecular Self-Assembled Molecular Glasses”, *Journal of the American Chemical Society*, **2007**, 129(3), 488-489.
  21. T.-D. Kim, J. Luo, Y. Tian, Z. Shi, N. M. Tucker, S.-H. Jang, A. K-Y. Jen, “Ultralarge and thermally stable electro-optic activities from Diels-Alder crosslinkable polymers containing binary chromophore systems”, *Advanced Materials*, **2006**, 18(22), 3038-3042.
  22. J. Luo, Y.-J. Cheng, T.-D. Kim, S. Hau, S.-H. Jang, Z. Shi, X.-H. Zhou, A. K-Y. Jen, “Facile Synthesis of Highly Efficient Phenyltetraene-Based Nonlinear Optical Chromophores for Electrooptics”, *Organic Letters*, **2006**, 8(7), 1387-1390.
  23. T.-D. Kim, J. Luo, Y. Tian, J.-W. Ka, N. M. Tucker, M. Haller, J.-W. Kang, A. K-Y. Jen, “Diels-Alder "Click Chemistry" for highly efficient electrooptic polymers”, *Macromolecules*, **2006**, 39(5), 1676-1680.
  24. M. Hochberg, T. Baehr-Jones, G. Wang, M. Shearn, K. Harvard, J. Luo, B. Chen, Z. Shi, R. Lawson, P. Sullivan, A. K-Y. Jen, L. Dalton, A. Scherer, “Terahertz all-optical modulation in a silicon-polymer hybrid system”, *Nature Materials*, **2006**, 5(9), 703-709.
  25. J. Luo, M. Haller, H. Ma, S. Liu, T.-D. Kim, Y. Tian, B. Chen, S.-H. Jang, L. R. Dalton, A. K-Y. Jen, “Nanoscale Architectural Control and Macromolecular Engineering of Nonlinear Optical Dendrimers and Polymers for Electro-Optics”, *Journal of Physical Chemistry B*, **2004**, 108(25), 8523-8530.
  26. J. Luo, M. Haller, H. Li, H.-Z. Tang, A. K-Y. Jen, K. Jakka, C.-H. Chou, C.-F. Shu, “A Side-Chain Dendronized Nonlinear Optical Polyimide with Large and Thermally Stable Electrooptic Activity”, *Macromolecules*, **2004**, 37(2), 248-250.
  27. M. S. Liu, J. Luo, A. K-Y. Jen, “Efficient Green-Light-Emitting Diodes from Silole-Containing Copolymers”, *Chemistry of Materials*, **2003**, 15(18), 3496-3500.
  28. J. Luo, M. Haller, H. Li, T.-D. Kim, A. K-Y. Jen, “Highly efficient and thermally stable electro-optic polymer from a smartly controlled crosslinking process”, *Advanced Materials*, **2003**, 15(19), 1635-1638.
  29. J. Luo, S. Liu, M. Haller, L. Liu, H. Ma, A. K-Y. Jen, “Design, synthesis, and properties of highly efficient side-chain dendronized nonlinear optical polymers for electro-optics”, *Advanced Materials*, **2002**, 14(23), 1763-1768.
  30. H. Ma, S. Liu, J. Luo, S. Suresh, L. Liu, S. H. Kang, M. Haller, T. Sassa, L. R. Dalton, A. K-Y. Jen, “Highly efficient and thermally stable electro-optical dendrimers for photonics”, *Advanced Functional Materials*, **2002**, 12(9), 565-574.
  31. J. Luo, Z. Xie, J. W. Y. Lam, L. Cheng, H. Chen, C. Qiu, H. S. Kwok, X. Zhan, Y. Liu, D. Zhu, B. Z. Tang, “Aggregation-induced emission of 1-methyl-1,2,3,4,5- *Chemical Communications*, **2001**, (18), 1740-1741 (Highlighted by *C&EN*, 79 (41), 29 (Oct. 8, 2001)).
  32. J. Luo, J. Hua, J. Qin, J. Cheng, Y. Shen, Z. Lu, P. Wang, C. Ye, “The design of second-order nonlinear optical chromophores exhibiting blue-shifted absorption and large nonlinearities: the role of the combined conjugation bridge”, *Chemical Communications*, **2001**, (2), 171-172.