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Education

Ph. D. Organic/Polymer/Materials Chemistry, Department of Chemistry, University of Southern California. 1999. Advisor: Larry R. Dalton.
With a milestone achievement in electro -optic material research , Science News, Vol 157, No. 15, p231, April 8, 2000. C&EN News, vol. 78, pp.12-3, 2000. LA Times, April 7,

- x Molecular engineering of second-order NLO chromophores for organic electro-optic (OEO) devices.
- x Conversion of Lignin into chemicals via hydrothermal treatment.

Research Funding:

2014.9.1 – 2017.8.31

2) The invention of a novel EO polymer CX2 and, for the first time in the EO polymer history, the simultaneous realization of all the major device -critical properties, i.e. low loss, high thermal stability and good poling efficiency in EO modulators made from CX2.
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3) Invention of the method to solve photostability of polymer EO devices, and its first demonstration in CLD1/APC electro-optic modulators.
US Patent, 6,616,865 B1, Sept. 9, 2003.
IEEE Journal on Selected Topics in Quantum Electronics, September/October 2001, 7 (5).

4) The first demonstration of EO polymer micro ring resonators in 2002.
"Polymer micro-ring filters and modulators." Payam Rabiei, W. H. Steier, Cheng Zhang, Larry R. Dalton. J. Lightwave Technology, Oct. 2002.

5) Invention of CLD (Cheng – Larry Dalton) series of second -order nonlinear optical chromophores in years 1998- 2000.
Dalton, Larry R.; Zhang, C.; et al. "Sterically stabilized second-order nonlinear optical chromophores and devices incorporating the same." U.S. 6,361,717 B1, March 26, 2002.
The current state-of-the-art second order NLO chromophores are still CLDs.

6) Joint invention of the Opto -Chip in 1999. CLD chromophores made possible the demonstration of the first sub-1 volt electrooptic modulators (opto-chips).
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7) The first realization of low optical loss (1.2 dB/cm at 1.55 μm) in high - PE chromophore - doped polymer in 1999 -2000.
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On the news:

Patents

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2. C. Zhang, H. R. Fetterman, W. Steier, J. Michael. "Sterically stabilized second-order nonlinear optical chromophores with improved stability and devices incorporating the same," US Patent, 6,616,865 B1, Sept. 9, 2003.
3. Dalton, Larry R.; Zhang, C.; Wang, C.; Fetterman, H. R.; Wang, F.; Steier, W.; Harper, A. W.; Ren, A. S.; Michael, J.. "Sterically stabilized second-order nonlinear optical chromophores and devices incorporating the same." U.S. 6,361,717 B1, March 26, 2002.
4. C. Zhang, H. R. Fetterman, W. Steier, J. Michael. "Sterically stabilized polyene-bridged second-order nonlinear optical chromophores and devices incorporating the same." U.S. Patent 6,348,992, February 19, 2002.
5. C. Zhang, H. R. Fetterman, W. Steier, J. Michael. "Polymers containing polyene-bridged second-order nonlinear optical chromophores and devices incorporating the same." 2000. 6,652,779 November 25, 2003.

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9. “Development of Conjugated Block Copolymers and Low Eg polymers” the Air Force Program Review meeting “2008 Polymer Chemistry” at Baltimore, May 5-9, 2008.
10. “Mono-

20. "Thermally Stable Polyene-Based NLO Chromophore and Its Poly

Graduate Research

1994.9-1998.12 Advisor: Prof. Larry R. Dalton, Chemistry Department, U. of Southern California.
Ph.D. Thesis: "Novel Phenylpolyene-Bridged Second-Order Nonlinear Optical Chromophores and New thermally Stable Polyurethanes for Electro-Optic Applications."

1991.9-1993.6 Ph. D. Candidate, the State Key Laboratory of Molecular Reaction Dynamics, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China.
Advisor: Prof. Guohe Sha. Laser spectroscopy, Molecular reaction dynamics, Nonlinear optics.