VITA

John E. Anthony
Professor
Department of Chemistry
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Education

B.A., Reed College (Portland, Oregon), 1989
Senior Thesis: "A Novel Synthesis of Tetramethyl Propadiene-1,1,3,3-tetracarboxylate"

Ph.D., University of California, Los Angeles, 1994
Dissertation: "New Materials from Tetraethynylethene" (F. N. Diederich)

Employment

Associate Director, UK Center for Applied Energy Research, 2022 - present
Professor, University of Kentucky, 2006 – present
CTO and Founder, Outrider Technologies LLC, 2005 - present
Associate Professor, University of Kentucky, 2002-2006
Assistant Professor, University of Kentucky, 8/16/1996-2002
Postdoctoral Researcher, Department of Chemistry, UCLA, 1994-1996 (Yves Rubin)
Research Associate, Department of Chemistry, ETH Zürich, Switzerland (1992-1994)
Graduate Teaching/Research Assistant, Department of Chemistry, UCLA, 1989-1992
Undergraduate Teaching Assistant, Department of Chemistry, Reed College, 1987

Honors

SEC Faculty Achievement Award (2023)
C.W. Hammond Professorship (2018 – 2026)
Keynote presenter at 2013 Kentucky Chamber of Commerce annual meeting, Louisville
UK Libraries Medallion for Intellectual Achievement, University of Kentucky, 2012
Albert D. and Elizabeth Kirwan Memorial Prize for research, University of Kentucky, 2012
University of Kentucky College of Education "Teacher who made a difference", 2009, 2012
University Research Professor, University of Kentucky, 2008
Hubbard Professorship (2008 – 2013, 2013 – 2018)
Gill Professorship (2002 – 2005, 2005 – 2008)
NSF CAREER Award (University of Kentucky, 1998)
Camille and Henry Dreyfus New Faculty Award (University of Kentucky, 1996)

ACS Division of Organic Chemistry Fellowship (UCLA, 1991-1992)
Du Pont Teaching Award (UCLA, 1990) and Clorox Graduate Research Award (UCLA, 1990)

American Chemical Society Undergraduate Award in Analytical Chemistry (Reed College, 1988)
Reed College Certificate of Academic Achievement (1986 and 1987)

Service Activities

Departmental
Associate Chair, Department of Chemistry (8/2010 – 7/2013)
Director of Graduate Studies, Department of Chemistry (8/2010 – 7/2013)
Faculty search committees 2000, 2001, 2002, 2005, 2008, 2018, 2019 (Chemical Engineering)
Building and Infrastructure Committee (chair, 1999 - 2009)
Departmental Safety Committee (1999 – 2006)
Executive committee (2008 - 2010)

Graduate Program Committee (2009 - 2013)
Graduate Recruiting and Admissions Committee (2004 – 2007, 2012 - 2013)
Tenure and promotion committee (Chair, 2015 - present)
Academic integrity committee (2020 – present)

College
Dean search committee (fall 2008 – spring 2009)
Dean's advisory committee (2006 – 2009)

University
Associate Director, UK Center for Applied Energy Research (2022 -)
University Environmental Health and Safety Committee (Chair, 2005 – 2010)
Scientific Diving Safety Committee (Chair, 2005 - 2010)
Army Research Office Advanced Carbon Nanotech Program – UK team leader (energy conversion, 2004 – 2009)
Intellectual property committee (2008 – 2011)
Reviewer, UK College of Design's studio on zero-energy housing design (Fall 2012)
Graduate Council, Dean's representative (2012)
Graduate Council (2017 – 2019)
Graduate School Committee on Fellowships & Traineeships (2020 -)
Project GATEWAY Steering Committee (2022 -)

Profession
NSF Panel Reviewer (at least twice a year since 2008)
NSF MRSEC Site Review Panelist (Johns Hopkins, 10/2009)
NSF Workshop, determining future directions for Macro, Nano and Supramolecular Chemistry (6/2010)
Ad-Hoc reviewer for DOE solid-state OLED lighting program (2008 – 2010)
Frequent reviews of publications, proposals, and tenure dossiers.
Co-organizer for the 2021 IFETC (International Flexible Electronics Conference) in Columbus, OH

Affiliations
Professional Member, ACS & MRS
Faculty associate, UK Center for Applied Energy Research
Dunbar High School MSTC Mentor (2003 - present)
Editorial advisory board, Journal of Organic Semiconductors
Technical advisory board, Next Energy Technologies (Santa Barbara, CA)
Technical advisory board, Orthogonal, Inc. (Rochester, NY)

Current Research Interests

New methods for the synthesis of polycyclic aromatic hydrocarbons and carbon nanostructures
Synthesis of functional organic semiconductors
Crystal engineering of aromatic compounds

Research Highlights

h-index (Google Scholar): 95, with 38,000 citations

Four published articles (#240, 176, 115, and 114) highlighted as "Highly Cited in Field" by Web of Science

Organized the 2014 Kentucky Organic Electronic Materials Workshop at the Center for Applied Energy Research, with funding secured from Kentucky NSF-EPSCoR

2014 Org. Lett. paper (#194) "Synthesis and optical properties of dioxolane-functionalized hexacenes and heptacenes" selected for ACS Editors' Choice recognition (reserved for the top 1% of papers published each year).

High School researcher Valerie Sarge took top chemistry honors at the 2014 Intel International Science and Engineering Fair

Invited commentary for Nature Materials on the "grand challenges" in organic electronics (August 2014)

Publication #88, “High-mobility spin-cast organic thin film transistors”, was highlighted by the journal *Applied Physics Letters* as one of the most downloaded articles over the last five years.

Our synthesis and characterization of nonacene was published as a VIP article in Angewandte Chemie (reserved for the top 5% of papers each year), and was selected by the journal Synfacts as a "Highlight in Current Synthetic Organic Chemistry". *Synfacts 10*, 1078 (2011).

Kentucky / Cornell solar cell project featured on The Discovery Channel’s website:
http://dsc.discovery.com/technology/slideshow/slide-show-solar-cell-solutions.html

Chemical Reviews article “Functionalized Acenes and Heteroacenes for Organic Electronics” – one of the most highly cited papers in the field published in the last two years – was selected as a “Hot Paper” by the American Chemical Society

Nature Materials paper “Contact-induced crystallinity for high performance soluble acene-based transistors and circuits“ was highlighted by the MIT Technology Review.

JACS paper “Functionalized pentacene: Improved electronic properties from control of solid-state order” was identified by Thomson-Reuters *Essential Science Indicators* as a “fast-moving front” in the field of organic transistors

APL paper “Large-area patterning of a solution-processable organic semiconductor to reduce parasitic leakage and off currents in thin-film transistors” was selected for highlight in the Virtual Journal of Nanoscale Science & Technology (June 25, 2007).

Sony / Toppan press release on 10.5” flexible, all-inkjet-printed display using TIPS Pentacene (Ref. 18, below) as active transistor material. (T. Okubo and co-workers, *IDW ’07*, SMD5-4L pp 463 – 464)’

Materials developed in my lab are now commercially available from major chemical suppliers.

Advanced Materials paper “Vibration-assisted crystallization improves organic / dielectric interface in organic thin film transistors” was highlighted both in Nature Materials (*Nature Materials* **12**, 946 (2013) doi:10.1038/nmat3801) and in Nature (*Nature* **502**, 9 (03 October 2013) doi:10.1038/502009c)

Technical lead, KY NSF EPSCoR Track 1 Kentucky Advanced Manufacturing Project for Enhanced Robotics and Structures

Awarded 18 month “Special Creativity Extension” (along with Risko and Jurchescu (Wake Forest)) for our NSF DMREF project, to develop medical X-ray detectors (March 2022 – September 2023).
http://kynsfepscor.uky.edu/uks-anthony-risko-receive-nsf-special-creativity-award/

Article 347, J. Chemical Physics "Optical readout of singlet fission biexcitons in a heteroacene with photoluminescence detected magnetic resonance," selected as an Editors’ Choice publication, one of only 80 articles selected by the editors as the most innovative and influential articles of 2022

High School student researchers Miranda Ma and Christina Lin won first place at the regional science fair for the research they performed in my labs, and placed second at the Kentucky state science fair.

Courses:

Basic and advanced organic chemistry, qualitative organic analysis lab, organic materials / polymer chemistry, general chemistry, chemistry seminar, physical organic chemistry

Research Publications

1. Y. Rubin, S. S. Lin, C. B. Knobler, J. Anthony, A. M. Boldi and F. Diederich, "Solution Spray Flash Vacuum Pyrolysis: A New Method for the Synthesis of Linear Poliynes with Odd Numbers of C-C Triple Bonds from Substituted 3,4-Dialkynyl-3-cyclobutene-1,2-diones," *J. Am. Chem. Soc., 113,* 6943-6949 (1991)

2. J. Anthony and F. Diederich, "Biphenyldialkylsilyl Chlorides: Reagents for the Formation of Crystalline Derivatives of Small Terminal Alkynes," *Tet. Lett.*, *32,* 3787-3790 (1991)

3. A. Boldi, J. Anthony, C. B. Knobler and F. Diederich, "Novel Cross-Conjugated Molecules Derived from Tetraethynylethene," *Angew. Chem. Intl. Ed. Engl., 31,* 1240-1242 (1992)

4. J. Anthony, C. B. Knobler and F. Diederich, "Stable [12] and [18] Annulenes Derived from Tetraethynylethene," *Angew. Chem. Intl. Ed. Engl., 32,* 406 - 409 (1993, Cover Article)

5. J. Anthony, C. Boudon,.F. Diederich, J.-P. Gisselbrecht, V. Gramlich, M. Gross, M. Hobi, P. Seiler, "Stable, Soluble Conjugated Carbon Rods with a Persilylethynylated Polytriacetylene Backbone." *Angew. Chem. Int. Ed. Engl.*, *33*, 763 - 766 (1994)

6. M. Schreiber, J. Anthony, F. Diederich, M. E. Spahr, R. Nesper, M. Hubrich, F. Bommeli, L. Degiorgi, P. Wachter, P. Kaatz, C. Bosshard, P. Günter, M. Colussi, U. W. Suter, C. Boudon, J.-P. Gisselbrecht and M. Gross, "Polytriacetylenes: Conjugated Polymers with a Novel All-Carbon Backbone." *Adv. Mater. 6,* 786-790 (1994)

7. C. Boudon, J.-P. Gisselbrecht, M. Gross, J. Anthony, A. M. Boldi, R. Faust, T. Lange, D. Philp, J.-D. Van Loon and F. Diederich, "Electrochemical Properties of Tetraethynylethenes, Fully Cross-Conjugated π-Chromophores, and Tetraethynylethene-Based Carbon-Rich Molecular Rods and Dehydroannulenes," *J. Electroanal. Chem*. *394,* 187-197 (1995)

8. J. Anthony, A. M. Boldi, Y. Rubin, M. Hobi, V. Gramlich, C. B. Knobler, P. Seiler and F. Diederich, "Tetraethynylethenes: Fully Cross-Conjugated π-Electron Chromophores and Molecular Scaffolds for All-Carbon Networks and Carbon-Rich Nanomaterials (Part I)," *Helv. Chim. Acta, 78,* 13-45 (1995)

9. A. M. Boldi, J. Anthony, V. Gramlich, C. B. Knobler, C. Boudon, J.-P. Gisselbrecht, M. Gross and F. Diederich, "Acyclic Tetraethynylethene Molecular Scaffolding: Multinanometer-Sized Linearly-Conjugated Rods with the Polytriacetylene Backbone and Cross-Conjugated Expanded Dendralenes (Part 2)," *Helv. Chim. Acta 78,* 779-796 (1995)

10. J. Anthony, A. M. Boldi, C. Boudon, J.-P. Gisselbrecht, M. Gross, P. Seiler, C. B. Knobler and F. Diederich, "Macrocyclic Tetraethynylethene Molecular Scaffolding: Perethynylated Aromatic Hexadehydro-[18]annulenes, Antiaromatic Tetradehydro[12]annulenes, and Expanded Radialenes. (Part 3)," *Helv. Chim. Acta 78,* 797-817 (1995)

11. J. E. Anthony, S. I. Khan, and Y. Rubin, "1,3,5/2,4,6-Differentiated hexaalkynylbenzenes: absorption and fluorescence properties of a D3h-symmetric donor-substituted system,"*Tetrahedron Lett. 38*, 3499 (1997)

12. D. M. Bowles and J. E. Anthony, "A Reiterative Approach to 2,3-Disubstituted Naphthalenes and Anthracenes." *Org. Lett., 2*, 85-87 (2000)

13. S.-Y. Chow, G. J. Palmer, D. M. Bowles, J. E. Anthony, "Perylene Synthesis by the Parallel Cycloaromatization of Adjacent Enediynes" *Org. Lett.*, *2*, 961-963 (2000)

14. D. M. Bowles, C. Landis, G.J. Palmer and J. Anthony, "Cycloaromatization Approaches to Curved Aromatic Structures." *Carbon*, *38*, 1671-1674 (2000)

15. G. J. Palmer, S. R. Parkin and J. E. Anthony, "Synthesis of a Remarkably Stable Dehydro[14]Annulene" *Angew. Chem. Int. Ed. Engl., 40,* 2509-2512 (2001)

16. D. M. Bowles, G. J. Palmer, C. A. Landis, J. L. Scott and J. E. Anthony, "The Bergman Reaction as a Synthetic Tool: Some Advantages and Restrictions: *Tetrahedron, 57*, 3753-3760 (2001)

17. J. S. Brooks, D. L. Eaton, J. E. Anthony, S. R. Parkin, J. W. Brill, and Y. Sushko, "Electronic and optical properties of functionalized pentacene compounds in the solid state" *Curr. Appl. Phys. - Physics, Chemistry, and Materials Science* 301 (2001)

18. J. E. Anthony, J. S. Brooks, D. L. Eaton and S. R. Parkin "Functionalized Pentacene: Improved Electronic Properties from Control of Solid-State Order" *J. Am. Chem. Soc. 123*, 9482 – 9483 (2001)

19. M. E. Gallagher and J. E. Anthony "Synthesis of linearly-fused benzodehydro[12]annulenes" *Tetrahedron Lett.* 7533 (2001)

20. J. E. Anthony, D. L. Eaton and S. R. Parkin "A Roadmap to Stable, Soluble, Easily Crystallized Pentacene Derivatives" *Org. Lett.*, *4*, 15 – 18 (2002)

21. L. C. Picciolo, H. Murata, A. Gondarenko, T. Noda, Y. Shirota, D.L. Eaton, J.E. Anthony, H. Duong, F. Wudl, and Z.H. Kafafi "RGB Emission Using a Dimesitylboryl-bithiophene Derivative as a Universal Host and Pentacene Derivatives as the Red Emitters" *Proc. SPIE* 2002.

22. R. C. Haddon, X. Chi, M. E. Itkis, J. E. Anthony, D. L. Eaton, T Siegrist "Band Electronic Structure of One- and Two-Dimensional Pentacene Molecular Crystals" *J. Phys. Chem. B* 106, 8288-8292 (2002).

23. D. Bom, R. Andrews, D. Jacques, J. Anthony, B. Chen, M. S. Meier, J. P. Selegue "TGA Investigation of the Stability of MWNT's Toward High-Temperature Oxidation. Evidence for the Role of Defect Sites in the Chemistry of Carbon Nanotubes" *Nano Letters 2*, 615 – 619 (2002).

24. T. Tokumoto, J.S. Brooks, R. Clinite, X. Wei, J. Anthony, D. Eaton, S. R. Parkin "Photo-Response of the Conductivity in Functionalized Pentacene Compounds" *J. Appl. Phys.* 92, 5208-5213 (2002).

25. F. A. Hegmann, R. R. Tykwinski, K. P. H. Lui, J. E. Bullock, J. E. Anthony "Picosecond Transient Photoconductivity in Functionalized Pentacene Molecular Crystals Probed by Terahertz Pulse Spectroscopy".*Phys. Rev. Lett.* 89, 227403 (2002).

26. D. L. Eaton, J. P. Selegue, J. Anthony, B. O. Patrick "Preparation and Structure of 3,4,8,9-Tetrachloro-2,5,7,10-Tetrahydro[1,6]dithiecine." *Heterocycles* 57, 2373-2381 (2002).

27. C. D. Sheraw, T. N. Jackson, D. L. Eaton, J. E. Anthony "Functionalized Pentacene Active Layer Organic Thin-Film Transistors" *Advanced Materials* 15, 2009-2011 (2003)

28. S. A. Odom, S. R. Parkin, J. E. Anthony "Tetracene derivatives as potential red emitters for organic LEDs" *Org. Lett.* 5, 4245-4248 (2003)

29. J. E. Anthony, J. S. Brooks, D. L. Eaton, J. R. Matson, S. R. Parkin " Synthesis, properties, and device applications of functionalized acenes." *Proc. SPIE-The International Society for Optical Engineering,* 5217, 124-132 (2003).

30. P. Nednoor, M. Capaccio, V. Gavalas, M. S. Meier, J. E. Anthony, L. G. Bachas "Hybrid Nanoparticles Based on Organized Protein Immobilization on Fullerenes." *Bioconj. Chem. 15*, 12-15 (2004).

31. C. A. Landis, M. M. Payne, D. L. Eaton and J. E. Anthony "Tellurium-mediated cycloaromatization of acyclic enediynes under mild conditions" *J. Am. Chem. Soc. 126*, 1338-1339 (2004)

32. J. L. Scott, S. R. Parkin, J. E. Anthony "Radical-induced cycloaromatization: routes to fluoranthenes and acephenanthrylenes" *Synlett*, 161 – 164 (2004).

33. J. S. Brooks, R. Vasic, T. Tokumoto, D. Graf, O. H. Chung, J. E. Anthony, S. A. Odom "Transport and melt processing in functionalized pentacene with "organic wire" connections." *Curr. Appl. Phys. 4*, 479 - 483 (2004)

34. J. S. Brooks, T. Tokumoto, E.-S. Choi, D. Graf, N. Biskup, D. L. Eaton, J. E. Anthony, S. A. Odom "Persistent photo-induced conducting states in functionalized pentacene" *J. Appl. Phys. 96,* 3312 – 3318 (2004)

35. M. M. Payne, J. H. Delcamp, S. R. Parkin, J. E. Anthony "Robust, Soluble Pentacene Ethers" *Org. Lett. 6*, 1609-1612 (2004).

36. M. M. Payne, S. A. Odom, S. R. Parkin, J. E. Anthony "Stable, crystalline acenedithiophenes with up to seven linearly-fused rings" *Org. Lett. 6,* 3325 – 3328 (2004)

37. L. S. Penn, J. C. Maillot, J. Anthony, M. M. Payne, B. D. Swiss, F. B. Mallory, K. Liu, R. A. Miller "Stiffening of engineering polymers by means of ribbon-like and plate-like molecules" *Proc. Ann. Mtg. Adhesion Soc.* 27, 99 – 101 (2004).

38. O. Ostroverkhova, D. G. Cooke, S. Shcherbyna, R. Egerton, R. R. Tykwinski, J. E. Anthony, F. A. Hegmann "Band-like transport in pentacene and functionalized pentacene thin films revealed by sub-picosecond transient photoconductivity Measurements" *Phys. Rev. B 71*, 035204(1-6) (2005)

39. J. E. Anthony, C. R. Swartz, C. A. Landis, S. R. Parkin "Synthesis, optical, thermal, and redox properties of 2,3,9,10-tetrasubstituted 6,13-dialkynylpentacenes" *Proc. SPIE 5940, Organic Field-Effect Transistors IV*, 594002 (30 August 2005); doi: 10.1117/12.615939

40. C. A. Landis, S. R. Parkin, J. E. Anthony "Silylethynylated anthracene derivatives for use in organic light-emitting diodes" *Jpn. J. Appl. Phys. 44*, 3921 – 3922 (2005).

41. M. M. Payne, S. R. Parkin, J. E. Anthony, C. C. Kuo, T. N. Jackson "Organic field-effect transistors from solution-deposited functionalized acenes with mobilities as high as 1 cm^2 / Vs" *J. Am. Chem. Soc 127*, 4986 – 4987 (2005).

42. M. M. Payne, S. R. Parkin, J. E. Anthony "Functionalized higher acenes: hexacene and heptacene" *J. Am. Chem. Soc. 127*, 8028 – 8029 (2005).

43. M. Capaccio, V. G. Gavalas, M. S. Meier, J. E. Anthony, L. G. Bachas "Coupling biomolecules to fullerenes through a molecular adapter" *Bioconj. Chem. 16*, 241 – 244 (2005).

44. V.P. Singh, R. S. Singh, B. Parthasarathy, A. Aguilera, J. Anthony, M. Payne "Copper-phthalocyanine-based organic solar cells with high open circuit voltage" *Appl. Phys. Lett*. 86, 082106(1-3) (2005).

45. V. P. Singh, B. Parthasarathy, R.S. Singh, A. Aguilera, J. Anthony, M. Payne "Characterization of high-photovoltage CuPc-based solar cell structures" *Solar energy materials and solar cells* 90, 798 – 812 (2006).

46. S. V. Shcherbyna, D. K. Bohme, V. I. Baranov, A. Loboda, C. Swartz, J. E. Anthony, "Clusterization of pentacene and functionalized pentacene ions in a matrix-assisted laser desorption / ionization orthogonal TOF mass spectrometer" *J. Am. Soc. Mass Spec.* 17, 222 – 229 (2006)

47. O. Ostroverkhova, S. Shcherbyna, D. G. Cooke, R. F. Egerton, F. A. Hegmann, R. R. Tykwinski, S. R. Parkin, J. E. Anthony "Optical and transient photoconductive properties of pentacene and functionalized pentacene thin films: Dependence on film morphology" *J. Appl. Phys. 98*, 033701 (2005).

48. A. Troisi, G. Orlandi, J. E. Anthony "Electronic interactions and thermal disorder in molecular crystals containing cofacial pentacene units" *Chem. Mater. 17*, 5024 – 5031 (2005).

49. C. R. Swartz, S. R. Parkin, J. E. Bullock, J. E. Anthony, A. C. Mayer, G. G. Malliaras "Synthesis and characterization of electron-deficient pentacenes" *Org. Lett. 7,* 3163 - 3166 (2005).

50. M. A. Wolak, J. S. Melinger, L. C. Palilis, C. A. Landis, J. H. Delcamp, J. E. Anthony, Z. H. Kafafi "Photophysical properties of dioxolane-substituted pentacene derivatives dispersed in tris(quinolin-8-oato) aluminum (III)" *J. Phys. Chem. B 110*, 7928 – 7937 (2006).

51. M. A. Wolak, J. Melinger, P. A. Lane, L. Palilis, C. Landis, J. Anthony, Z. Kafafi "Dynamics of Energy Transfer of a dioxolane-substituted pentacene dispersed in 4,4-bis[*N*-1-napthyl-*N*-phenyl-amino]biphenyl" *J. Phys. Chem. B. 110*, 10606 – 10611 (2006).

52. T. Tokumoto, J. S. Brooks, D. Graf, E. S. Choi, N. Biskup, D. L. Eaton, J. E. Anthony, S. A. Odom "Persistent photo-excited conducting states in functionalized pentacene" *Synth. Met. 152*, 449-452 (2005)

53. J. G. Park, R. Vasic, J. S. Brooks, J. E. Anthony "Functionalized pentacene field-effect transistors with logic circuit applications" *J. Low. Temp. Phys. 142*, 387 – 392 (2006).

54. K. C. Dickey, J. E. Anthony, Y.-L. Loo "Improving organic thin-film transistor performance through solvent vapor annealing of solution-processable triethylsilylethynyl anthradithiophene" *Adv. Mater. 18*, 1721 - 1726 (2006))(cover article).

55. M. A. Wolak, J. Delcamp, C. A. Landis, P. A. Lane, J. Anthony, Z. H. Kafafi "High performance organic light-emitting diodes based on dioxolane-substituted pentacene derivatives" *Adv. Func. Mater. 16*, 1943 - 1947 (2006).

56. O. Ostroverkhova, D. G. Cooke, F. A. Hegmann, J. E. Anthony, V. Podzorov, M. E. Gershenson, O. D. Jurchescu, T. T. M. Palstra "Ultrafast carrier dynamics in pentacene, functionalized pentacene, tetracene and rubrene single crystals" *Appl. Phys. Lett. 88*, 162101 (1-3) (2006).

57. O. Ostroverkhova, D. G. Cooke, F. A. Hegmann, R. R. Tykwinski, S. R. Parkin, J. E. Anthony "Anisotropy of sub-picosecond transient photoconductivity in functionalized pentacene single crystals" *Appl. Phys. Lett 89*, 192113 (2006).

58. M. T. Lloyd, A. C. Mayer, A. S. Tayi, A. M. Bowen, T. G. Kasen, D. J. Herman, D. A. Mourey, J. E. Anthony, G. G. Malliaras "Photovoltaic cells from a soluble pentacene derivative" *Organic Electronics. 7,* 243-248 (2006).

59. S. K. Park, C.-C. Kuo, J. E. Anthony, T. N. Jackson "High-mobility solution-processed OTFTs" *2005 International Electron Device Meeting Technical Digest* 113 – 116 (2006).

60. J. G. Park, R. Vasic, J. S. Brooks, J. E. Anthony "Characterization of functionalized pentacene field-effect transistors and logic gate applications" *J. Appl. Phys. 100*, 044511 (1-6) (2006).

61. J. Chen, J. Anthony, D. C. Martin "Thermally induced solid-state phase transition of bis(triisopropylsilylethynyl) pentacene crystals" *J. Phys. Chem. 110*, 16397 – 16403 (2006).

62. J. Chen, C. K. Tee, J. Yang, C. Shaw, M. Shtein, D. C. Martin, J. Anthony "Thermal and mechanical cracking in bis(triisopropylsilylethynyl) pentacene thin films" *J. Polym Sci. B; Polym. Phys. 44*, 3631 – 3641 *(2006)*

63. J. Anthony "Functionalized acenes and heteroacenes for organic electronics" *Chem. Rev. 106*, 5028 - 5048 *(2006) (invited review as part of a special issue, "Engineering the Molecular World").*

64. J. Anthony "The larger acenes: versatile organic semiconductors" *Angew. Chem. Int. Ed.47*, 452 – 483 (2008).

65. J. Chen, J. Anthony, D. C. Martin "Morphology and molecular orientation of thin film TIPS pentacene" *J. Mater. Res. 22*, 1701 – 1709 (2007).

66. S. K. Park, T. N. Jackson, J. E. Anthony, D. A. Mourey "High Mobility Solution Processed 6,13-bis(triisopropyl-silylethynyl)pentacene organic thin film transistors" *Appl. Phys. Lett. 91*, 063514 (2007).

67. M. T. Lloyd, A. C. Mayer, S. Subramanian, D. A. Mourey, D. J. Herman, A. V. Bapat, J. E. Anthony, G. G. Malliaras "Efficient Solution-Processed Photovoltaic Cells Based on an Anthradithiophene / Fullerene Blend" *J. Am. Chem. Soc. 129,* 9144 – 9149 (2007)

68. J. E. Anthony, J. Gierschner, C. A. Landis, S. R. Parkin, J. B. Sherman, R. C. Bakus "A new functionalization strategy for pentacene" *Chem Commun.* 4746 – 4748 (2007).

69. K. C. Dickey, S. Subramanian, J. E. Anthony, L.-H. Han, S. Chen, Y.-L. Loo "Large-area patterning of a solution-processable organic semiconductor to reduce parasitic leakage and off currents in thin-film transistors" *Appl. Phys. Lett. 90*, 244103 (2007). (also selected for publication in *The Virtual Journal of Nanoscale Science & Technology*).

70. K. C. Dickey, Y.-L. Loo, T. J. Smith, K. J. Stevenson, S. Subramanian, J. E. Anthony "Establishing efficient electrical contact to the weak crystals of triethylsilylethynyl anthradithiophene" *Chem. Mater. 19*, 5210 - 5215 (2007).

71. M. T. Lloyd, G. G. Malliaras, J. E. Anthony "Organic photovoltaics from soluble small molecules" *Materials Today 10*, 34 – 41 (2008) (invited review).

72. S. K. Park, J. E. Anthony, T. N. Jackson "Solution-processed TIPS pentacene organic thin film transistor circuits" *IEEE Electron. Dev. Lett. 28,* 877 – 879 (2007).

73. O. D. Jurchescu, B. H. Hamadani, H. D. Xiong, S. K. Park, S. Subramanian, N. M. Zimmerman, J. E. Anthony, T. N. Jackson, D. J. Gundlach, "Direct correlation between microstructure, electronic properties and flicker noise in organic thin film transistors" *Appl. Phys. Lett. 92*, 132103 (2008).

74. D. J. Gundlach, J. E. Royer, S. K. Park, S. Subramanian, O. D. Jurchescu, B. H. Hamadani, A. J. Moad, R. J. Kline, L. C. Teague, O. Kirillov, C. A. Richter, J. G. Kushmerik, L. J. Richter, S. R. Parkin, T. N. Jackson, J. E. Anthony "Contact-induced crystallinity for high performance soluble acene-based transistors and circuits" *Nature Materials 7*, 216 – 221 (2008).

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Book Chapters

J. E. Anthony "Synthesis and electronic properties of functionalized pentacenes" in *Organic Electronics – an Industrial Perspective* (H. Klauk, Ed.) Wiley-VCH, Berlin, (2006).

J. E. Anthony "Inducing pi-stacking in acenes" in *Functional Organic Materials* (U. H. F. Bunz, T. Mueller, Eds.), Wiley-VCH Berlin (2007).

J. E. Anthony and A. G. Jones "Silyletnyne-substituted acenes and heteroacenes for organic electronics" in *Organic Electronics II – an Industrial Perspective* (H. Klauk, Ed.) Wiley-VCH, Berlin, April 2012.

Patents

Granted:

Silylethynyl pentacene compounds and compositions and methods of making and using the same

By Caldwell, Gregg Alexander; Clough, Robert Steven; Novack, James Craig; Redinger, David Howard; Vogel, Dennis Edward; Anthony, John E.; Payne, Marcia M. From U.S. (2015), US 8956555 B2 20150217

Fluorinated silylethynyl pentacene compounds and compositions and methods of making and using the same

By Clough, Robert Steven; Flynn, Richard M.; Moore, George G. I.; Anthony, John E.; Payne, Marcia M.

From U.S. (2014), US 8920679 B2 20141230

Synthesis of silyl acetylenes

By Clough, Robert S.; Anthony, John E.; Payne, Marcia M.

From U.S. (2014), US 8779179 B2 20140715

Silylethynylated heteroacenes and electronic devices made therewith

By Anthony, John E.

From PCT Int. Appl. (2008), WO 2008107089 A1 20080912

Design of a semiconductor device employing substituted pentacene compounds

By Anthony, John E.; Eaton, David L.; Parkin, Sean. From U.S. (2004), US 6690029 B1 20040210

Malachite green based radiochromic compounds and radiation sensing systems incorporating the compounds
A.L. Washington, II, I.J.T. Bobbitt, J.E. Anthony, B. Peters, J.C. Nicholson, inventors; University of Kentucky Research Foundation, USA; Savannah River Nuclear Solutions, LLC . assignees. patent US20200239692A1. 2020.

Applications:

End-substituted heteroacenes with pairwise coupling in crystalline form for pure spin polarization and optical readout

J.E. Anthony, K.J. Thorley, E.K. Holland (UK), J. Johnson, B. Rugg, B. Fluegel (NREL), PCT/US2023/063583

Fluorinated silylethynyl pentacene compounds and compositions and methods of making and using the same

By Clough, Robert Steven; Anthony, John E.; Flynn, Richard M.; Moore, George G. I.; Payne, Marcia M. From PCT Int. Appl. (2010), WO 2010138807 A1 20101202

Silylethynylpentacene compounds and compositions and methods of making and using the same

By Anthony, John E.; Caldwell, Gregg Alexander; Clough, Robert Steven; Novack, James Craig; Payne, Marcia M.; Redinger, David Howard; Vogel, Dennis Edward. From PCT Int. Appl. (2009), WO 2009155106 A1 20091223

Reversibly Reducible Materials and Use Thereof
John Anthony and Susan Odom, Utility Appl. No. 15/730,428 October 11, 2017

End-substituted heteroacenes with pairwise coupling in crystalline form for pure spin polarization and optical readout
J.E. Anthony, K.J. Thorley, E.K. Holland (UK), J. Johnson, B. Rugg, B. Fluegel (NREL), PCT/US2023/063583 (March 2023).

Provisionals:
Reversibly Reducible Materials and Use Thereof
J. E. Anthony, S. A. Odom, filed 11 October, 2016, #62/405,733.

Current Grants and Contracts

"DMREF: Collaborative Research: Organic semiconductors by computationally-accelerated refinement (OSCAR)", National Science Foundation, $540,000, 10/16 – 9/20 (with Chad Risko)

"DMREF: Collaborative Research: Organic semiconductors by computationally-accelerated refinement (OSCAR)", National Science Foundation *SUPPLEMENT*, $100,000, 10/18 – 10/20 (Chad Risko, lead)

"DMREF: Collaborative Research: Organic semiconductors by computationally-accelerated refinement (OSCAR)", National Science Foundation *COVID SUPPLEMENT*, $54,000, 10/18 – 3/21 (John Anthony, lead)

"DMREF: Collaborative Research: Organic semiconductors by computationally-accelerated refinement (OSCAR)", National Science Foundation, Awarded 18 month "Special Creativity Extension" (along with Risko and Jurchescu (Wake Forest) ($271, 150, March 2022 – September 2023).

"RII Track-1: Kentucky Advanced Manufacturing Partnership for Enhanced Robotics and Structures", NSF-EPSCoR, $2,998,610, 9/1/19 – 8/31/24, UK project lead.

"TATTOO Radiation dosimeters" DTRA sub-contract through Santa Barbara Sensor Technology. Phase 1: $93,000, 3/2022 – 12/2023

Completed Grants and Contracts (2017 – present)

"Molecular control of spin-entangled triplet excitons from singlet fission", DOE BES, $298,084 (UK sub-contract amount) for 10/01/18 – 12/22/21. Sole UK PI, Justin Johnson (National Renewable Energy Laboratory) lead.

"Synthesis and Characterization of highly electron dense organic based materials", DHS / sub-contract through Savannah River National Labs, $65,000 1/16 – 12/16

"A Non-Aqueous Redox Flow Battery Prototype", NSF- PFI-AIR-TT, total $200,000 for 7/15/17 – 12/31/2018 (PI Susan Odom (UK) and Fik Brushett (MIT), Co-I John Anthony (UK) and James Landon (CAER)).

"A Low Temperature Flow Battery Prototype for Space Applications", KY-NASA-EPSCoR, $33,323 for 6/1/17 - 12/31/18 (with Susan Odom).

"Bespoke crystallization to enable high-performance organic electronics and circuits", KAUST Competitive Research Grants Program, $210,000, 04/2017 – 03/2020. Sole UK PI.

"Organic Radiochromic Detectors", DOE sub-contract through Savannah River National Labs, $70,000 05/18 – 12/19.

"Acquisition of a microsource single-crystal diffractometer for materials research", NSF-MRI, $354,371, 7/16 – 6/19 (with Sean Parkin (lead), Susan Odom, Phoebe Glazer).

"Dynamic disorder in organic semiconductors", NIST, $17,200, 1 Nov 2019 – 31 Dec 2019

"Revisiting the Dehydroannulenes", National Science Foundation, $471,000, 10/16 – 9/21

Company Information

Outrider Technologies formed as a LLC in April, 2005, has exclusive license from the University of Kentucky of two critical Anthony-group patents filed through U.K.

All Outrider materials are now committed to larger commercialization partners. Outrider and 3M jointly developed new, high-performance materials for a variety of electronics applications, and are providing scale-up quantities of first-generation materials to an array of display manufacturers. Outrider materials now appear in a variety of chemical supplier catalogs.

Outrider research has shifted focus to emissive materials for bio-imaging and venture capital investments.

M. S. Theses Directed (current employment)

Siew-Yin Chow, 1997 – 2000 (Ph.D. Biological Chemistry, Texas A&M University, 2004)
Megan Gallagher, 1997 – 2001 Employed as a researcher at Abbott Laboratories
John Scott, 1998 – 2002 Employed by the Tennessee Bureau of Investigations
Marcello Capaccio, 1999 – 2002 Returned to Italy
Volodomyr Pashovich 2002 – 2004 Employed by DuPont in Maryland
Kerri Shelton, 2008 – 2011, now at U. Dayton
Jennifer Washbourne, 2010 – 2016, left the program
Garrett Fregoso, 2017 – 2022

Ph.D. Theses Directed (current employment)

Grant J. Palmer, 1996-2001 Adaptimmune
Daniel M. Bowles, 1996-2001 Pfizer, then Cambrex
David Eaton, 1997 – 2002 Gentex
Chris Swartz 2000 – 2006 post-doc, Center for Applied Energy Research, UK
Chad Landis 2000 – 2005 Plextronics
Marcia Payne 2000 – 2005 Outrider Technologies
Sankar Subramanian 2003 – 2007 Assoc. Director, Black Diamond Theraputics
Balaji Purushothaman 2004 – 2010 University of Melbourne (PD)
Ying Shu, 2007 – 2010 CSIRO Australia (PD), now a stay-at-home mom
Marsha Loth 2006 – 2011 faculty position, U. Pittsburgh, Johnstown.
Matt Bruzek, 2008 – 2013, 3M
Rawad Hallani, 2010 – 2015, Research Engagement Specialist, KAUST
Devin Granger, 2011 – 2017, Senior Chemist, Ingevity
Anthony Petty, 2013 – 2018, Senior Staff Scientist, Solenis
Samuel Mazza, 2014 – 2018, Left program due to health issues.
Emma Holland, 2016 – 2021, Patent agent, DLA Piper
Dean Windemuller, 2018 – present, in progress
Tanner Smith, 2018 – present, in progress
Zach Lawson, 2018 – Spring 2020, Left program due to academic issues
Eve Aldridge, 2021 – present, in progress
Barron Cox, 2021 – present, in progress

Post-Doctoral Scholars Directed (employment)

Dr. Jeff Harris (Clemson Ph.D.) April 2006 – August 2007
Dr. Adolphus Genay Jones (U. Florida Ph.D.) May 2007 – June 2009 (Cryolife, Inc.)
Dr. Zhong Li (SUNY Stony Brook Ph.D.), September 2008 – June 2011
Dr. Marcia Payne (UK Ph.D.), June 2011 – December 31, 2017
Dr. Emilie Ripaud (Université Angers Ph.D.), June 2011 – Dec. 2013
Dr. Karl Thorley (Oxford Ph.D.), January 2013 – May 2016
Dr. Thilanga Liyanage (UK Ph.D.), January 2013 – December 2015

Visiting Scholars Directed

Prof. Kevin Revell (Murray State U.) Summer 2009
Prof. K.C. Russell (Northern Kentucky U) Fall 2012 sabbatical project
Ms. Ulrike Kraft (Max Planck Institute, Stuttgart) Fall 2011, Spring 2013
Mr. Manuel Schaffroth (U. Heidelberg), Spring 2014
Mr. François Simon (U. Namur, Belgium), Spring 2016
Dr. Karl J. Thorley (Imperial College), Fall 2018 – present.

Undergraduate Research Directed

Frank Hanzel, Allegheny College, Summer 1997
Justin Moore, University of Kentucky, Spring 1998
Devon Rosenfeld, Rowan University, Summer 1998 (Ph.D. Cornell)
Chad Landis, University of Kentucky, Spring 1999 - Fall 2000 (UK Ph.D. 2005)
Kim Lott, University of Kentucky, Spring 2000 - Summer 2000
Joe Bullock, University of Kentucky, Summer 2001 – 2004 (In Ph.D. program at Northwestern)
Susan Odom, University of Kentucky, Fall 2001 – Summer 2003 (Faculty, U. Kentucky)
Jared Delcamp, University of Kentucky, Spring 2003 – Spring 2005 (Faculty, U. Mississippi)
Thomas Johnston, University of Kentucky, Spring 2003 – Spring 2004 (applying to medical school)
Jeffrey Struss, University of Kentucky, Fall 2003 – Spring 2004
Richard Maggard, University of Kentucky, Fall 2004
Ronald Bakus, University of Kentucky, Fall 2005 – Spring 2006 (In Ph.D. program at UCSB)
Jessica Sherman, University of Kentucky, Fall 2006 – Spring 2009
Rawad Hallani, University of Kentucky, Summer 2009 – Summer 2010
DJ Dirkes, Unviersity of Kentucky, Spring 2011 –
Pat Simmons, University of Kentucky, Spring 2011 –
Jack Moore, University of Kentucky, Fall 2011 – Spring 2012
Sam Beavin, University of Kentucky, Spring 2012 – Summer 2012
Zach Stewart, University of Kentucky, Fall 2012 – Summer 2013
Matthew Nisbet (Centre College) (Summer 2014)
Katelyn Long (Transylvania University) (Spring 2014)
Paige Higdon (Summer 2014 – Spring 2015)
Calvin Hong (Summer 2014 – Spring 2015)
James Isaacs (Fall 2014, Spring 2015)
Ashley Heighton (Fall 2015 – Fall 2016)
Joseph DeVerges (Spring 2016 – Summer 2016)
Greg Rummel (Fall 2017 – Summer 2018)
William Jackson (Fall 2017 – Spring 2018)
Caroline Thornbury (Spring 2018 – Spring 2019)
Adam Kinyua (Berea College) (Summer 2018)
Adam Monsanto (Kentucky State University) (Summer 2021)
Barron Cox (Centre College) (Summer 2021)
Sarah Veazey (Fall 2021)
Carleigh Phelon (Spring 2022)
Andrew Sturgis (Fall 2022)
Mason Reeves (Fall 2022 -)

High-School Students Directed

Daniel Sweat (Fall 2003 – Spring 2004, now at Georgia Tech)
Kate Oliver (Spring 2004 – Spring 2005, now at U. Missouri, Rolla)
Erica Lamanna (Spring 2004 – Spring 2005, now at Seaton Hall)
Sahill Naik (Spring 2006 – Summer 2007)
Andrew Luy (Spring 2008 – Spring 2009)
Wei Du (Spring 2009 – Summer 2010)
Jonathan Karp (Fall 2010 – Spring 2011, now at Washington University)
Valerie Sarge (Summer 2012 – Summer 2014, now at MIT) – research earned her the ACS award at the Intel International Science and Engineering Fair in 2014.
Ryan Blood (Spring 2013 – Fall 2014)
Helen Pang (Dunbar, Fall 2017 – Summer 2018)
Miranda Ma (Dunbar, Spring 2023 -)
Christina Lin (Dunbar, Spring 2023 -)

Graduate Recruiting Seminars

Eastern Kentucky University- Chemistry, 9/1997
Western Kentucky University – Chemistry, 10/2002.
University of Cincinnati – Chemsitry, 11.2002.
University of Louisville – Chemsitry, 3/2003.
Austin Peay – Chemistry, 10/2003
Northern Kentucky University – Chemistry, 11/2003
Eastern Kentucky University – Chemistry, 2/2004
Lee University – Chemistry, 10/2004
Juniata College – Chemistry, 4/2005
Rhodes College – Chemistry, 10/2008
Centre College – Chemistry, 5/2010
Oklahoma State University – Chemistry, 3/2012
Duquesne University – Chemistry, 9/2012
Dennison University – Chemistry, 9/2012
Berea College (Berea, KY), 9/2014
Centre College (Danville, KY), 3/2015
Georgetown College (Georgetown, KY), 11/2022

Invited Academic and Industrial Presentations

University of Oregon – Chemistry, 5/2001.
Ohio State University – Chemistry, 10/2001
University of California, Los Angeles – Chemistry, 10/2001
University of California, Berkeley – Chemistry, 11/2001
University of California, San Diego – Chemistry, 11/2001
University of California, Riverside - Chemistry, 11/2001
Northwestern University – Chemistry, 11/2001
University of Michigan – Chemistry, 10/2002
Case Western Reserve University – Macromolecular Science, 10/2002.
Bowling Green State University – Chemistry, 9/2003
University of Alabama, Tuscaloosa – Chemistry, 3/2004
Center for Applied Energy Research – Engineering, 6/2004
Florida State University – Chemistry, 9/2004
Cornell University – Materials Science and Engineering 9/2004
University of Houston – Chemistry, 9/2004
Georgia Institute of Technology - Chemistry, 2/2005
Johns Hopkins University – Chemical Engineering, 10/2005
University of Kentucky – Physics, 11/2005
University of Alberta – Chemistry 1/2006
University of Minnesota – Chemistry, 11/2007
Wright-Patterson Air Force Base – 1/2008

New York University – Chemistry, 4/2008
Seoul National University – Chemistry, 6/2008
Gyeongseng National University – Materials Science / Engineering, 6/2008
University of Erlangen – Nürnberg – Chemistry, 7/2008
UCLA – Chemistry, 2/2009
Western Carolina University – Chemistry, 3/2009
University of Massachussets, Amherst – Materials Engineering, 9/2009
Chinese University of Hong Kong - Chemistry, 11/2009
Princeton University – Chemical Engineering, 2/2010
Wake Forest University – Physics, 2/2011
King Abdullah University of Science and Technology (Jeddah, Saudi Arabia), 6/2011
Texas A&M University (College Station, TX), 9/2011
Mississippi State University (Columbus, MS), 9/2011
University of Oregon (Eugene, OR), 6/2012
Tufts University (Boston, MA), 9/2012
BASF Ludwigshafen (Frankfurt, Germany), 5/2012
Merck Chilworth (Southampton, England), 5/2012
Cambridge University (Cambridge, England), 5/2012
Ohio State University (Columbus, OH), 10/2012
Dalhousie University (Halifax, NS, Canada), 3/2013
Cambridge University (Cambridge, England), 4/2013
Merck HQ (Darmstadt, Germany), 9/2013
University of Heidelberg (Germany), 9/2013
University of Tuebingen (Germany), 9/2013
Colorado School of Mines (Boulder, CO), 1/2014
National Renewable Energy Laboratory (Boulder, CO), 1/2014
U. de Montreal (Montreal, Canada), 5/2014
McGill University (Montreal, Canada), 5/2014
Laval University (Quebec City, Canada), 5/2014
Penn State University (Chem. Engineering, State College PA), 5/2014
Princeton University – Chemistry (Princeton, NJ), 3/2015
U. Nebraska Lincoln (Lincoln, NE), 2/2016
U. Missouri St. Louis (St. Louis, MO), 4/2016
U. Oregon (Eugene, OR), 5/2016
U. Nevada (Reno, NV), 3/2017
Savannah River National Laboratory (Aiken, SC), 5/2017
U. Louisville (Louisville, KY), 03/2018
Georgetown U. (Washington, DC), 10/18/2018
U. Arizona (Tucson), 04/04/2019

Outrider Technologies Presentations

3M, St. Paul, MN 9/05
Avecia Inc. Manchester, England 10/2005
Merck Inc., Southampton, England, 6/2007
Cheil Industries / Samsung, Seoul, Korea 6/2008
Functionalized Acenes in Solar Cells, Plextronics, Inc., Pittsburgh, PA, 2/2010
Merck Inc., Southampton, England, 5/2010

Invited Conference Presentations

Gordon Research Conference on Organic Structures and Properties, *Invited talk*, September 1998, Fukuoka, Japan; "Cycloaromatization Routes to Graphite Oligomers."

Fullerenes '99 Symposium, August 1999, Toulouse, France; "Cycloaromatization Approaches to Curved Aromatic Structures"

NSF Workshop on Physical Organic Chemistry, June 2000, San Diego, CA; "New Parameters for the Bergman Reaction"

Naval Research Laboratory, "Functionalized Carbon Materials: Electronics to Composites" July 2001.

The Materials Society, Organic Materials Conference, "Crystal Engineering Approach to Organic Materials" 6/2002.

International Conference on Display Technology, Cancún Mexico "Display Applications of Acenes" 8/2002

International Conference on Display Technology, Cancún Mexico "Pentacene-Based Photovoltaics" 8/2002

DARPA Organic Spintronics Workshop "Potential Spintronic Applications of High-Mobility Functionalized Acenes" 4/2003

Naval Research Laboratory, "Acenes in Display Technologies" 6/2003.

DARPA Interface Engineering Conference "Tuning the Organic / Metal Interface for Organic Electronics" 9/2003.

2nd Annual Kentucky Nanotechnology Seminar / Workshop, Louisville, KY "Organic Molecular Nanotechnology" 9/2003

Sixth International Symposium on Functional π-Electron Systems, Ithaca, New York "Synthesis, Characterization And Device Application Of Functionalized Acenes: Structure - Property Relationships" **Highlighted Talk** 6/2004

62nd Device Research Conference, Notre Dame IN, "The Molecular Engineering of Acenes: Avoiding the Drawbacks of Improved Solubility" 6/2004

Gordon Research Conference on Electron Donor-Acceptor Interactions, Newport RI "Tuning the donor/acceptor properties of crystal-engineered acenes" 8/2004

NSF Workshop on "The Synthesis of Complex Chemical Systems" – "Stabilization of Acenes: Practical and Fundamental Issues" Massachusetts Institute of Technology, 3/2005

American Physical Society, March Meeting "Preparation and Properties of Functionalized Acenes", Baltimore, MD, 3 / 2006

NSF Workshop on Macromolecular, Supramolecular and Nanochemistry: From Grand Challenges to the Research Priorities of Molecular Systems Chemistry "Small molecules for big electronics", Arlington, VA, 6 / 2010

TUTORIAL: Tutorial U, Organic Semiconductor Crystals 101 (with Alex Briseno, Jun Takeya, Vitaly Podzorov) MRS Fall meeting, 11/2011

TUTORIAL: Tutorial P, Organic Semiconductor Crystals 101 (with Alex Briseno, Alberto Morpurgo, Vitaly Podzorov) MRS Fall meeting 11/2012

Topic: "Design Aspects of Functionalized Organic Semiconductors"
Electronic Processes in Organic Crystals, Workshop on Single Crystal Transistors Baltimore, MD, 3 / 2006.
ACS Spring 2007 meeting, special session on polymers and oligomers for organic electronics, Chicago, IL
DARPA workshop on 3-D Design of Organic Semiconductors, New Orleans, LA, 1 / 2007
Spring MRS meeting, 4 / 2007
European Science Foundation, Nanoscale Engineering Workshop (Strasbourg, France) 5 / 2007
University of Mons (Mons, Belgium) 6 / 2007
University of Hasselt (Hasselt, Belgium) 6 / 2007
SPIE Optics and Photonics (San Diego, CA) 8 / 2007
3M, (St. Paul, MN) 11/2007
International Chemical Conference, Taiwan (Hsinchu, Taiwan) 12 / 2007
Asian Symposium on Organic Materials for Electronics and Photonics (Jochiwon, Korea) 6 / 2008
International Conference on Organic Synthesis (Daejeon, Korea) 6 / 2008
8th Functional π-Electron Systems conference, (Graz, Austria) 7 / 2008

International Symposium on Organic Transistors and Functional Interfaces (Sendai, Japan) 8 / 2008
Pacifichem (Honolulu, HI) 12/2010
International School and Symposium on Multifunctional Molecule-based Materials (Argonne National Lab) 3/2011
Lectures at the Cutting Edge, University of Toronto (Toronto, Canada) 3 / 2011
Central Regional Meeting of the American Chemical Society (Indianapolis, IN) 6 / 2011

Topic: "Functionalized acenes and heteroacenes for organic electronics"
SPIE Conference on Organic Field-Effect Transistors, 8/2003
Eastman Kodak, 5/2004
Gentex Corp., Zeeland, MI 7/2004
Xerox Research Center Canada. Toronto, Ontario, Canada 9/2004
ACS / IEEE / MRS Organic Microelectronics Workshop, Newport, RI, July 10 – 13, 2005
SPIE Optics & Photonics, San Diego, CA, Jul. 31 – Aug. 4, 2005
11th International Symposium on Novel Aromatics, St. Johns, NL, Canada, 8/2005 (Plenary)
Pacifichem, Honolulu, HI (12/2005) (invited)
7th Functional π-Electron Systems conference, Osaka, Japan 5/2006 (Plenary)
Electronic Materials Conference (State College, PA) 5 / 2006
SPIE Optics & Photonics, San Diego, CA, August 13 – 17 8 / 2006
SPIE Optics & Photonics (San Diego, CA) 8 / 2008
Electrochemical Society (Vienna, Austria) 10/2009
International Kyoto Conference in Organic Chemistry (Kyoto, Japan) 11/2009
Materials Research Society Fall Meeting (Boston, MA) 11/2009
Materials Research Society, Spring Meeting (San Francisco, CA) 4/2010
National Renewable Energy Laboratory (Golden, CO) 4/2010
4th OFET workshop, Transistors and Interfaces (Les Diablerets, Switzerland) 5/2010
Canadian Society of Chemistry, National Meeting (Plenary lecture, Toronto, Canada) 6/2010
Center for Applied Molecular Photovoltaics, annual meeting (Stanford, CA) 6/2010
Gordon Research Conference, Electronic Processes in Organic Materials (South Hadley, MA) 7/2010
SPIE Optics & Photonics (San Diego, CA) 8/2010
American Vacuum Society, National Meeting (Albequerque, NM) 10/2010
Materials Research Society Fall Meeting (Boston, MA) 11/2010
10th Functional π-Electron Systems conference, Beijing, China 10/2011
Materials Research Society Spring Meeting (San Francisco, CA) 4/2014

"Non-Fullerene Acceptors for Organic Photovoltaics" Symposium H, MRS Fall meeting, 11/2011

"Exploring the larger acenes" Symposium U, MRS Fall meeting, 11/2011

"New acceptors for organic photovoltaics", MRS Spring meeting, 4/2012

"New approaches to organic photovoltaic materials", European Materials Research Society meeting, Strassbourg, France, 5/2012

"Larger acenes for organic transistors" SPIE Optics & Photonics, San Diego, CA, 8/2012

"New acceptors for organic photovoltaics", Organic Excitonic Solar Cells conferences, Queensland Australia, 9/2012

"Molecule design for organic electronics", CSIRO Melbourne, Australia, 9/2012

"Crystal design for organic transistors" Conference on Transistors & Functional Interfaces, Princeton, NJ, 10/2012

"Designed small molecules for organic transistors", Fall MRS, Boston, Nov 27 2012

"Molecular design for organic electronics", Second UCSB / Imperial College workshop on organic electronics, Santa Barbara, CA Feb. 10, 11 2013.

"Carbon materials for solar power generation", First SEC Symposium, "Renewable Energy", Atlanta GA Feb. 12 2013.

"Crystal engineering and organic semiconductors" Spring MRS, San Francisco, 3/3/2013

"Rational design of organic semiconductors" Merck CASE conference, Southampton, England, 4/15/2013

"New developments in small-molecule organic semiconductors", 11th Functional π-Electron Systems Conference, Arcachon France June 3 – 7, 2013

"Crystal design for organic semiconductors" International Symposium on Flexible Organic Electronics, Thessaloniki, Greece July 8 – 11, 2013.

"Small-molecule semiconductors", European Conference on Molecular Electronics, London, England, Sept. 2 – 6, 2013

"Carbon-rich materials for organic electronics" Symposium on Synthetic Carbon Allotropes, Erlangen, Germany, Sept. 29 - Oct. 2, 2013.

"Small molecule design for organic electronics", CECAM workshop on theoretical chemistry, Lausanne, Switzerland, Oct. 22 – 25, 2013.

"Recent progress in molecular semiconductors", KAUST workshop on flexible electronics and photovoltaics, Thuwal, Saudi Arabia, Oct. 30 – Nov. 2, 2013.

TUTORIAL: "Small-molecule design for organic electronics", 90-minute tutorial at the International School for Molecular Materials, Tokyo Tech, Tokyo, Japan, Nov. 5 – 8, 2013.

Invited participant, NSF – DOE workshop on "BIG DATA" for the design of new energy materials, Gaithersberg, MD Nov. 19 – 20, 2013.

"A Stroll Along the Acenes", American Chemical Society workshop on "Conjugated Materials from Texas and Beyond", ACS Spring Meeting in Dallas, TX, March 19, 2014.

"Small-molecule non-fullerene acceptors for OPV", Excitonic Photovoltaics Workshop, Telluride, CO, August 12, 2014

"Small molecule design for organic electronics", International Conference on Physical Organic Chemistry, Ottawa, Canada, August 15, 2014

"The impact of isomer purity on the performance of anthradithiophene transistors", SPIE, San Diego, CA, August 18, 2014.

"Carbon materials for flexible electronics" PLENARY lecture, Fusion conference, Casablanca, Morocco, Sep. 22 – 25, 2014.

"Small Molecule Design for Organic Electronics", invited talk, 7th International Workshop on Advanced Materials and Nanotechnology, Halong Bay, Vietnam, Nov. 1 – 5, 2014

"Molecular design for organic electronics", invited talk, Fall 2014 Materials Research Society meeting, Boston, MA, Dec. 1 – 4, 2014.

"Charge Transport and Transfer in small-molecule organic semiconductors" 578th W. E. Heraeus Seminar, Cologne, Germany, Dec. 9 – 12, 2014.

"Small molecule semiconductors for flexible electronics", LOPEC Conference, Münich, Germany, Mar. 3 – 5, 2015.

"Exploring crystal motifs in organic semiconductors", Spring 2015 Materials Research Society meeting, San Francisco, CA, April 6 – 9, 2015.

"Crystal design for organic semiconductors", symposium on organic single crystals, European Materials Research Society meeting, Lille, France, May 11 – 14, 2015.

"Singlet fission in acenes – tetracene through hexacene" Workshop on Singlet Fission, Uni. Erlangen, Germany, May 14 – 17, 2015.

"Routes to stabilization of linearly-fused aromatics" Electrochemical Society Spring meeting, Chicago, IL, May 24 – 27, 2015.

"Crystal design for organic electronics" International Conference on Materials for Advanced Technologies, Singapore, June 28 – July 1, 2015.

"Exploring dimensionality in small-molecule organic semiconductors" SPIE Optics & Photonics, San Diego, CA, Aug. 10 – 13, 2015.

"Solid-state synthons in the design of organic semiconductor crystals", International Materials Research Congress, Cancun, Mexico, Aug. 17 – 20, 2015.

"Functionalized acenes in organic electronics", COPE Industry Partners' Day, Georgia Tech, Atlanta, GA, Sept. 18.

"Acenes in organic photovoltaics: Acceptors and singlet fission", Quimicuba, Havana, Cuba, October 12 – 14, 2015.

"Isomer purity and processing in anthradithiophenes", Fall 2015 Materials Research Society meeting, Boston, MA, Nov. 29 – Dec. 2, 2015

"Solution and solid-state reactions of the acenes" Pacifichem 2015, Honolulu, HI, Dec. 16 – 19, 2015.

"Functionalized acenes in organic electronics" Pacifichem 2015, Honolulu, HI, Dec. 16 – 19, 2015.

"Photophysics of the larger acenes" Photonics West 2016, San Francisco, CA, Feb. 15 – 17, 2016.

"Relating molecular structure to solid-state order and device performance in small-molecule organic semiconductors", Symposium in honor of Antonio Facchetti, American Chemical Society meeting, San Diego, CA, Mar. 13 – 17, 2016.

"Photophysical properties of organic semiconductors", Workshop on magnetism and spin in organic materials, Queen Mary University London, Apr. 16 – 20, 2016.

"Crystal design for organic electronics", Canadian Society for Chemistry annual meeting, Halifax, NS, Canada, June 7 – 10, 2016.

"New chromophores for organic electronics" SPIE Optics & Photonics, San Diego, CA, August 28 – 31, 2016

"Functionalized acenes for organic electronics: Molecular design considerations" German Center for Nanoscience workshop, Venice, Italy, Sept. 19 – 22, 2016.

"Organic semiconductors – molecular design considerations" SFB-921 program workshop, Berlin, Germany, October 26 – 28, 2016.

"Synthesis of electronic and photonic materials: The critical role of chromophore functionalization", 27th Quebec-Ontario Minisymposium in Synthetic and Bioorganic Chemistry, Waterloo, ON, Canada, November 11 – 13, 2016.

"Functionalization vs. transport in organic semiconductors", Solvay Conference on Charge, Spin and Heat Transport in Organic Semiconductors, Brussels, Belgium, November 15 – 17, 2016.

"Molecular design for flexible organic electronics", Norwegian Conference on Flexible Electronics, Trondheim, Norway, December 7 – 8, 2016.

"Disorder and polymorphism in organic semiconductors", 13th Functional Pi Electron Materials conference, Hong Kong, China, June 4 – 9, 2017

"Exploring new chromophores for organic electronics", International Symposium for Novel Aromatics, Stony Brook NY, July 24 – 28, 2017.

"Tackling disorder in organic semiconductors", SPIE Optics & Photonics conference, San Diego, CA, Aug. 6 – 10, 2017.

"Organic approaches to radiation detection", IEEE Nuclear Science Symposium & Medical Imaging Conference, Atlanta, GA, October 21-22, 2017

"Womens' role in the evolution of herbal medicine to medicinal chemistry", lecture to EKU WGS class at the Pharmacia di Santa Maria Novella in Florence, Italy, June 14, 2018

"Processing and polymorphism in organic semiconductors", European Materials Research Society, Strasbourg, France, June 18, 2018

"A modular approach to solid-state engineering of organic chromophores", European Materials Research Society, Strasbourg, France, June 19, 2018.

"Charge transport and singlet fission in acenes and heteroacenes", International Conference on Organic Electronics, Bordeaux, France, June 19 – 22, 2018.

"Controlling crystalline order for organic electronics applications", Gordon Research Conference on crystal engineering, Holiday Valley, Maine, June 24 – 28, 2018.

"Rational design of small molecule organic semiconductors", Materials for Organic Electronics workshop, Heidelberg, Germany, June 29-30, 2018.

"Polymorphism and disorder in organic semiconductors", Joint US/EU EXTMOS workshop (computational design of organic semiconductors), Princeton U., Princeton, NJ, July 9-12, 2018.

"Polymorphism and disorder in organic semiconductors", SPIE Optics and Photonics, San Diego, CA, Aug. 19 – 23, 2018.

"Small molecule semiconductors for flexible electronics", EU Summer School on Flexible Electronics, Paphos, Cyprus, Nov. 4 – 8, 2018.

"Functionalized benzodithiophene as a universal crystal engineering core", MRS Fall Meeting, Boston, Nov. 26 – 30 2018

"Functionalized acenes – a long strange trip", François Diederich Retirement Symposium, ETH Zürich, Switzerland, June 2-3, 2019

"Small molecule design for organic electronics", 14th International Symposium on Functional π-electron Systems, Berlin, Germany, June 3 – 5, 2019

"Acene self-assembly", Telluride Conference on Self-Assembly for Organic Electronics, Telluride, CO, July 21 – 26, 2019

"New small-molecule chromophores & functionalization schemes for organic field-effect transistors", SPIE Organic Photonics + Electronics, San Diego, CA, August 12 – 15, 2019

"Small molecule organic semiconductor design", Research and Applications of Photonics in Defense (RAPID), Miramar Beach, Fl, August 19 – 21, 2019

"Designed aromatic structures for electronics and photonics", SFB symposium on carbon allotropes, Erlangen, Germany, Sept. 29 – Oct. 2, 2019.

"Crystal engineering for oligoacenes", Fall 2019 Materials Research Society National meeting, Boston, MA, Dec. 1 – 6, 2019.

"An Overview of Organic Electronics and Photonics: From Flexible Displays to Enhanced Photovoltaics", CAER Seminar Series (virtual seminar) April 7, 2020 – more than 100 attendees.

"Self-assembly in linearly-fused organic semiconductors: The fragile 2D π-stack" Telluride Scientific Research Conference, Telluride, CO, July 18 – 24, 2021

"Exploring self-assembly in functionalized acenes" SPIE Organic Photonics + Electronics, San Diego, CA, August 1 – 4, 2021

"Self-assembled soluble organic semiconductors", Fall Materials Research Society meeting, Boston, MA, November 29 – December 2, 2021

"Crystal engineering of acene-based semiconductors and the delicate 'brickwork' π-stack" Spring Materials Research Society meeting, Honolulu, HI, May 8-12, 2022

"Extended aromatic structures for organic electronics" (CONTRIBUTED talk), International Symposium on Novel Aromatic Structures, Warsaw, Poland, July 3 – 8, 2022

"Crystal design for small-molecule organic semiconductors" International Conference on Synthetic Metals, Glasgow, Scotland, July 17 – 22, 2022

"Crystal structure tuning of new chromophores for organic transistors" SPIE, San Diego, CA, August 21 – 24, 2022

"Organic small-molecule active material design for radiation sensing" PLENARY lecture, SPIE, San Diego, CA, August 21 – 24, 2022

"Synthesis and Structure-Function Relationships in Fused Aromatics for Electronic and Photonic Applications" Materials Research Society Fall meeting, Boston, MA, November 28 – December 2, 2023,

"Exciton Manipulation to Enhance Photovoltaic Power Generation" KAUST Research Conference: Sustainable Energy Materials and Technologies for a Low Carbon Future, Thuwal, Saudi Arabia, March 20 – 22, 2023

"Crystal Design for Sustainable Organic Semiconductors" 15th International Conference on Functional Pi Systems, Raleigh, NC, June 17 – 21, 2023

"Crystal Design for Organic Electronic Devices" Keynote Lecture, International Symposium on Flexible and Organic Electronics, Thessaloniki, Greece, July 2 – 6, 2023.

"Crystal Design for Organic Transistors" SPIE Optics and Electronics Conference, San Diego, CA, August 20 – 24, 2023.

"Organic active-layer radiation sensors based on transistors and dyes" SPIE Optics and Electronics Conference, San Diego, CA, August 20 – 24, 2023.