

BIOGRAPHICAL SKETCH

Alberto Salleo – Born: 03/April/1971

Department of Materials Science and Engineering
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(a) Professional Preparation

University of Rome *La Sapienza*
University of California, Berkeley

Chemistry
Materials Science

Laurea 1994
Ph.D. 2001

(b) Appointments

2013-	Associate Professor of Materials Science, Stanford University, Stanford, CA
2005-2012	Assistant Professor of Materials Science, Stanford University, Stanford, CA
2004-2005	Member of Research Staff, PARC Inc., Palo Alto, CA
2001-2004	Postdoctoral Fellow, PARC Inc., Palo Alto, CA

(c) Professional Activities

- Principal Editor of MRS Communications
- Associate Editor of Journal of Electronic Materials
- Member of the Advisory Board: Journal of Organic Electronics
- Conference Chair: OFET 2012 (Princeton)
- Co-organizer, Materials Research Society Meeting Symposia:
 - Symposium P: Single-Crystalline Organic and Polymer Semiconductors: Fundamentals and Devices, November 2012.
 - Symposium V: Advanced Materials Processing for Scalable Solar-Cell Manufacturing II, April 2012.
 - Symposium E: Molecular and Hybrid Materials for Electronics and Photonics, November 2010.
 - Symposium G: Organic and Hybrid Materials for Large-Area Functional Systems, December 2008.
 - Symposium O: Organic Thin-film Electronics, April 2007.
- Member, Users Executive Committee, Stanford Synchrotron Radiation Lightsource, 2011 to present.
- Member, Organizing Committee, Electronic Materials Symposium, 2011- present.
- Elected Member, Organizing Committee, Electronic Materials Conference, 2010 - present.
- Symposium Organizer, 2009 International Conference on Advanced Materials
- Freshmen advisor for 46 undergraduates, 2006 - present.
- Major advisor for 6 undergraduates.

(d) Honors and Awards: Tau Beta Pi Excellence in Undergraduate Teaching Award, SPIE Early Career Award (2010), 3M Untenured Faculty Award (2007-2009), NSF Career Award (2007-2011), PARC Outstanding Performance Award (2003 and 2004), Fulbright Fellow (1995-2000), John Tyssowski Memorial Fellow, UC Berkeley (1997), Italian University Council Award for Outstanding Students Abroad (1997).

(e) Publications:

147 Articles in peer-reviewed journals/Citation: 4977/h-index: 33

Laser Processing of Materials:

W. Mustafeez, D. Lee, C. Grigoropoulos, A. Salleo, "Precipitation of silicon nanoclusters by laser direct-write," *Optics Express*, 19, 15452 (2011).

S. Lee, M.F. Toney, W. Ko, J.C. Randel, H.J. Jung, K. Munakata, J. Lu, T.H. Geballe, M.R. Beasley, R. Sinclair, H.C. Manoharan, A. Salleo, "Laser-Synthesized Epitaxial Graphene," *ACS Nano*, 4, 7524 (2010).

Organic Electronics/Bioelectronics:

R. Noriega, J. Rivnay, K. Vandewal, F.P.V. Koch, N. Stingelin, P. Smith, M.F. Toney, A. Salleo, "A general relationship between disorder, aggregation and charge transport in conjugated polymers," *Nature Materials*, Advance Online (2013).

K. Vandewal, S. Himmelberger, A. Salleo, "Structural Factors That Affect the Performance of Organic Bulk Heterojunction Solar Cells," *Macromolecules*, ASAP (2013).

B.D. Naab, S. Himmelberger, Y. Diao, K. Vandewal, P. Wei, B. Lussem, A. Salleo, Z. Bao, "High Mobility N-Type Transistors Based on Solution-Sheared Doped 6,13-Bis(triisopropylsilylethynyl)pentacene Thin Films," *Advanced Materials*, Early View (2013).

E. Wang, J. Bergqvist, K. Vandewal, Z. Ma, L. Hou, A. Lundin, S. Himmelberger, A. Salleo, C. Muller, O. Inganäs, F. Zhang, M.R. Andersson, "Conformational Disorder Enhances Solubility and Photovoltaic Performance of a Thiophene-Quinoxaline Copolymer," *Advanced Energy Materials*, 3, 806 (2013).

S. Himmelberger, J. Dacuna, J. Rivnay, L.H. Jimison, T. McCarthy-Ward, M. Heeney, I. McCulloch, M.F. Toney, A. Salleo, "Effects of Confinement on Microstructure and Charge Transport in High Performance Semicrystalline Polymer Semiconductors," *Advanced Functional Materials*, 23, 2091 (2013).

C. Muller, M. Aghamohammadi, S. Himmelberger, P. Sonar, M. Garriga, A. Salleo, M. Campoy-Quiles, "One-Step Macroscopic Alignment of Conjugated Polymer Systems by Epitaxial Crystallization during Spin-Coating," *Advanced Functional Materials*, 23, 2368 (2013).

C.C. Wang, J. Rivnay, S. Himmelberger, K. Vakhshouri, M.F. Toney, E.D. Gomez, A. Salleo, "Ultrathin Body Poly(3-hexylthiophene) Transistors with Improved Short-Channel Performance," *ACS Appl. Mater. Interfaces*, 5, 2342 (2013).

G. Lu, J. Blakesley, S. Himmelberger, P. Pingel, J. Frisch, I. Lieberwirth, I. Salzmann, M. Oehzelt, R. Di Pietro, A. Salleo, N. Koch, D. Neher, "Moderate doping leads to high performance of semiconductor/insulator polymer blend transistors," *Nature Communications*, 4, 1588 (2013).

L.H. Jimison, S. Himmelberger, D.T. Duong, J. Rivnay, M.F. Toney, A. Salleo, "Vertical Confinement and Interface Effects on the Microstructure and Charge Transport of P3HT Thin Films," *J. Polym. Sci., Part B: Polym. Phys.*, 51, 611 (2013).

D.T. Duong, C.C. Wang, E. Antono, M.F. Toney, A. Salleo, "The chemical and structural origin of efficient p-type doping in P3HT," *Organic Electronics*, 14, 1330 (2013).

E.T Hoke, K. Vandewal, J.A. Bartelt, W.R. Mateker, J.D. Douglas, R. Noriega, K.R. Graham, J.M.J. Frechet, A. Salleo, M.D. McGehee, "Recombination in Polymer:Fullerene Solar Cells with Open-Circuit Voltages Approaching and Exceeding 1.0 V," *Advanced Energy Materials*, 3, 220 (2013).

D.T. Duong, M.F. Toney, A. Salleo, "Role of confinement and aggregation in charge transport in semicrystalline polythiophene thin films," *Phys. Rev. B*, 86, 205205 (2012).

J. Rivnay, S.C.B. Mannsfeld, C.E. Miller, A. Salleo, M.F. Toney, "Quantitative Determination of Organic Semiconductor Microstructure from the Molecular to Device Scale," *Chemical Reviews*, 112, 5488 (2012). [review]

J. Dacuna, W. Xie, A. Salleo, "Estimation of the spatial distribution of traps using space-charge-limited current measurements in an organic single crystal," *Phys. Rev. B*, 86, 115202 (2012).

E. Orgiu, N. Crivillers, M. Herder, L. Grubert, M. Patzel, J. Frisch, E. Pavlica, D.T. Duong, G. Bratina, A. Salleo, N. Koch, S. Hecht, P. Samori, "Optically switchable transistor via energy-level phototuning in a bicomponent organic semiconductor," *Nature Chemistry*, 4, 675 (2012).

P.S. Jo, A. Vailionis, Y.M. Park, A. Salleo, "Scalable Fabrication of Strongly Textured Organic Semiconductor Micropatterns by Capillary Force Lithography," *Advanced Materials*, 24, 3269 (2012).

A.J. Kronemeijer, E. Gili, M. Shahid, J. Rivnay, A. Salleo, M. Heeney, H. Sirringhaus, "A Selenophene-Based Low-Bandgap Donor-Acceptor Polymer Leading to Fast Ambipolar Logic," *Advanced Materials*, 24, 1558 (2012).

S. Ko, E. Hoke, L. Pandey, S. Hong, R. Mondal, R. Rajib; C. Risko, Y. Yi, R. Noriega, M. McGehee, J.-L. Bredas, A. Salleo, Z. Bao, "Controlled conjugated backbone twisting for an increased open-circuit voltage while having a high short-circuit current in poly(hexyl)thiophene derivatives," *J. Am. Chem. Soc.*, 134, 5222 (2012).

C.H Peters, I.T. Sachs-Quintana, W.R. Mateker, T. Heumueller, J. Rivnay, R. Noriega, Z.M. Beiley, E.T. Hoke, A. Salleo, M.D. McGehee, "The Mechanism of Burn-in Loss in a High Efficiency Polymer Solar Cell," *Advanced Materials*, 24, 663 (2012).

K. Vakhshouri, D.R. Kozub, C. Wang, A. Salleo, E.D. Gomez, "Effect of Miscibility and Percolation on Electron Transport in Amorphous Poly(3-Hexylthiophene)/Phenyl-C61-Butyric Acid Methyl Ester Blends," *Phys. Rev. Lett.*, 108, 026601 (2012).

J. Dacuna, A. Salleo, " Modeling space-charge-limited currents in organic semiconductors: Extracting trap density and mobility," *Phys. Rev. B*, 84, 195209 (2011)

D.P. McMahon, D.L. Cheung, L. Goris, J. Dacuna, A. Salleo, A. Troisi, "Relation between Microstructure and Charge Transport in Polymers of Different Regioregularity," *J. Phys. Chem. C*, 115, 19386 (2011).

Z.M. Beiley, E.T. Hoke, R. Noriega, J. Dacuna, G.F. Burkhard, A. Salleo, M.F. Toney, M.D. McGehee, "Morphology-Dependent Trap Formation in High Performance Polymer Bulk Heterojunction Solar Cells," *Advanced Energy Materials*, 1, 954 (2011).

B.W. Boudouris, V. Ho, L.H. Jimison, M.F. Toney, A. Salleo, R.A. Segalman, " Real-Time Observation of Poly(3-alkylthiophene) Crystallization and Correlation with Transient Optoelectronic Properties," *Macromolecules*, 44, 6653 (2011).

K.P. Goetz, Z. Li, J.W. Ward, C. Bougher, J. Rivnay, J. Smith, B.R. Conrad, S.R. Parkin, T.D. Anthopoulos, A. Salleo, J.E. Anthony, O.D. Jurchescu, "Effect of Acene Length on Electronic Properties in 5-, 6-, and 7-Ringed Heteroacenes," *Advanced Materials*, 23, 3698 (2011).

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J. Rivnay,* R. Noriega,* R.J. Kline, A. Salleo, M.F. Toney, "Quantitative analysis of lattice disorder and crystallite size in organic semiconductor thin films" *Physical Review B*, 84, 045203 (2011). (*equal contribution)

J. Rivnay, R. Steyrleuthner, L.H. Jimison, A. Casadei, Z. Chen, M.F. Toney, A. Facchetti, D. Neher, A. Salleo, "Drastic control of texture in a high performance n-type polymeric semiconductor and implications for charge transport," *Macromolecules*, 44, 5246 (2011).

J. Kwiatkowski, L.H. Jimison, A. Salleo, A.J. Spakowitz, "A Boltzmann-weighted hopping model of charge transport in organic semicrystalline films," *J. Appl. Phys.* 109, 113720 (2011).

J. Rivnay, R. Noriega, J.E. Northrup, R.J. Kline, M.F. Toney, A. Salleo, "Structural origin of gap states in semicrystalline polymers and the implications for charge transport." *Physical Review B*, 83, 121306 (2011).

J. Rivnay, M.F. Toney, Y. Zheng, I.V. Kauvar, Z. Chen, V. Wagner, A. Facchetti, A. Salleo, "Unconvention Face-On Texture and Exceptional In-Plane Order of a High Mobility n-Type Polymer," *Advanced Materials*, 22, 4359 (2010).

A. Salleo, R.J. Kline, D.M. DeLongchamp, M.L. Chabynyc, "Microstructural Characterization and Charge Transport in Thin Films of Conjugated Polymers," *Advanced Materials*, 22, 3812 (2010). [review]

W.M Zhang, J. Smith, S.E. Watkins, R. Gysel, M. McGehee, A. Salleo, J. Kirkpatrick, S. Ashraf, T. Anthopoulos, M. Heeney, I. McCulloch, "Indacenodithiophene Semiconducting Polymers for High-Performance, Air-Stable Transistors," *J. Am. Chem. Soc.*, 132, 11437 (2010).

J.L. Baker, L.H. Jimison, S. Mannsfeld, S. Volkman, S. Yin, V. Subramanian, A. Salleo, A.P. Alivisatos, M.F. Toney, "Quantification of Thin Film Crystallographic Orientation Using X-ray Diffraction with an Area Detector," *Langmuir*, 26, 9146 (2010).

C. Wang, L.H. Jimison, L. Goris, I. McCulloch, M. Heeney, A. Ziegler, A. Salleo, "Microstructural Origin of High-Mobility in High-Performance Poly(thieno-thiophene) Thin Film Transistors," *Advanced Materials*, 22, 697 (2010).

A.C. Arias, D. MacKenzie, I. McCulloch, J. Rivnay, A. Salleo, "Materials and Applications for Large-Area Electronics: Solution-Based Approaches," *Chemical Reviews*, 110, 3, (2010). [review]

J. Rivnay, L.H. Jimison, J.E. Northrup, M.F. Toney, R. Noriega, S. Lu, T.J. Marks, A. Facchetti, A. Salleo, "Large modulation of carrier transport by grain-boundary molecular packing and microstructure in organic thin films," *Nature Materials*, 8, 952 (2009).

B. Meredig, A. Salleo, R. Gee, "Ordering of Poly(3-hexylthiophene) Nanocrystallites on the Basis of Substrate Surface Energy," *ACS Nano*, 3, 2881 (2009).

Y.M. Park and A. Salleo, "Dual gate organic thin film transistors as chemical sensors," *Applied Physics Letters*, 95, 133307 (2009).

L.H. Jimison, M.F. Toney, I. McCulloch, M. Heeney, and A. Salleo, "Charge Transport Anisotropy Due to Grain Boundaries in Directionally Crystallized Thin Films of Regio-Regular Poly(3-hexylthiophene)", *Advanced Materials*, 21, 1568 (2009).

L.H. Jimison, A. Salleo, M.L. Chabinyk and M.F. Toney, "Correlating the microstructure of thin films of Poly[5,5'-bis(3-dodecyl-2-thienyl)-2,2'-bithiophene] with charge transport: effect of dielectric surface energy and thermal annealing.", *Physical Review B*, 78, 19 (2008).

M. Chabinyk, L.H. Jimison, J. Rivnay, A. Salleo, "Connecting Electrical and Molecular Properties of Semiconducting Polymers for Thin Film Transistors", *MRS Bulletin*, 33, 683-689 (2008). [invited theme article]

J. Rivnay, L.H. Jimison, M.F. Toney, M. Priener, N.A. Melosh, A. Salleo, "Interfacial effects in thin films of polymeric semiconductors", *J. Vac. Sci. Technol. B*, 26, 1454-1460 (2008).

A. Salleo, A. C. Arias, "Solution Based Self-Assembly of an Array of Polymeric Thin-Film Transistors", *Advanced Materials* 19, 3540 (2007).

A. Salleo, "Charge transport in polymeric transistors", *Materials Today* 10(3), 38 (2007). [invited review]

Solution-Processed Oxides:

S. Mehra, M.G. Christoforo, P. Peumans, A. Salleo, "Solution processed zinc oxide nanopillar/silver nanowire transparent network films with highly tunable light scattering properties.", *Nanoscale*, 5, 4400 (2013).

E. Della Gaspera, M. Bersani, M. Cittadini, M. Guglielmi, D. Pagani, R. Noriega, S. Mehra, A. Salleo, A. Martucci, "Low-Temperature Processed Ga-Doped ZnO Coatings from Colloidal Inks," *JACS*, 135, 3439 (2013).

S. LeBlanc, S. Phadke, T. Kodama, A. Salleo, K.E. Goodson, "Electrothermal phenomena in zinc oxide nanowires and contacts," *Appl. Phys. Lett.*, 100, 163105 (2012).

S. Phadke, J.-Y. Lee, J. West, P. Peumans, A. Salleo, "Using Alignment and 2D Network Simulations to Study Charge Transport Through Doped ZnO Nanowire Thin Film Electrodes" *Advanced Functional Materials* 21, 4691 (2011).

Y.M. Park, J. Daniel, M. Heeney, A. Salleo, "Room-Temperature Fabrication of Ultra-Thin Oxide Gate Dielectrics for Low-Voltage Operation of Organic Field Effect Transistors" *Advanced Materials* 23, 971 (2011).

R. Noriega, J. Rivnay, L. Goris, D. Kalblein, H. Klauk, K. Kern, L.M. Thompson, A.C. Palke, J.F. Stebbins, J.R. Jokisaari, G. Kusinski, A. Salleo, "Probing the electrical properties of highly-doped Al:ZnO nanowire ensembles," *Journal of Applied Physics*, 107, 074312 (2010).

G.J. Kusinski, J.R. Jokisaari, R. Noriega, L. Goris, M. Donovan, A. Salleo, "Transmission electron microscopy of solution-processed, intrinsic and Al-doped ZnO nanowires for transparent electrode fabrication," *Journal of Microscopy*, 237, 443 (2010).

R. Devan, M. Marinkovic, R. Noriega, S. Phadke, A. Salleo, D. Knipp, "Light Trapping in Thin Film Silicon Solar Cells with Periodic Pyramid Texture," *Optics Express*, 17, 23058 (2009).

L. Goris, R. Noriega, M. Donovan, J. Jokisaari, G. Kusinski, A. Salleo, "Intrinsic and Doped Zinc Oxide Nanowires for Transparent Electrode Fabrication via Low-Temperature Solution Synthesis", *Journal of Electronic Materials*, 38, 586-595 (2009).

Book chapters and review articles:

R. Noriega, S. Mehra, A. Salleo, "Solution-grown n-type ZnO nanostructures: synthesis, microstructure and doping," *Handbook of ZnO and Related Materials*, Z. C. Feng Ed., Taylor and Francis/CRC Press (2012), [book chapter].

R. Noriega, A. Salleo, "Charge Transport Theories in Organic Semiconductors," *Organic Electronics Vol.II: More Materials and Applications*, H. Klauk Ed., Wiley-VCH Verlag (2011), [book chapter].

D. James, D. Smith, M. Heeney, T. Anthopoulos, A. Salleo, I. McCulloch, "Organic Semiconductors in Transistor Applications," *Organic Electronics Vol.II: More Materials and Applications*, H. Klauk Ed., Wiley-VCH Verlag (2011), [book chapter].

W. S. Wong, M. L. Chabinyc, T. N. Ng, A. Salleo, "Materials and Novel Patterning methods for Flexible Electronics," *Flexible Electronics: Materials and Applications*, W. W. Wong and A. Salleo Eds., Springer Verlag (2009), [book chapter].

A. Salleo and W. S. Wong Editors, "Flexible Electronics: Materials and Applications," Springer Verlag, (2009) [edited book]

I. McCulloch, M. Heeney, M.L. Chabinyc, D. DeLongchamp, R.J. Kline, M. Coelle, W. Duffy, D. Fischer, D. Gundlach, B. Hamadani, R. Hamilton, L. Richter, A. Salleo, M. Shkunov, D. Sporrowe, S. Tierney, W. Zhong, "Semiconducting Thienothiophene Copolymers: Design, Synthesis, Morphology, and Performance in Thin-Film Organic Transistors," *Advanced Materials* 21, 1091 (2009) [invited review].

R. A. Street, W. S. Wong, S. E. Ready, M. L. Chabinyc, A. C. Arias, S. Limb, A. Salleo, and R. Lujan, "Jet printing flexible displays," *Materials Today* 9, 32 (2006) [invited review].

A. Salleo and M. L. Chabinyc, "Stability of organic transistors," *Organic Electronics*, H. Klauk Ed., Wiley-VCH Verlag (2006), [book chapter].

M. L. Chabinyc, W. S. Wong, A. C. Arias, S. E. Ready, R. Lujan, J. H. Daniel, B. Krusor, R. B. Apte, A. Salleo, and R. A. Street, "Printing Methods and Materials for Large-Area Electronic Devices," *Proc. IEEE special issue on Flexible Electronics Technology* 93(8), 1491 (2005) [invited review].

M. L. Chabynec and A. Salleo, "Materials requirements and fabrication of active matrix arrays of organic thin-film-transistors for displays," special issue of Chemistry of Materials on Organic Electronics 16 (23), 4509 (2004). [invited review]

R. B. Apte, B. S. Ong, R. A. Street, A. Salleo, M. L. Chabynec, A. C. Arias, "Organic Electronics," Flexible Flat Panel Displays, G. P. Crawford Ed. (2004) [book chapter].