



Professor Seth R. Marder
Regents' Professor
School of Chemistry and Biochemistry
Georgia Institute of Technology
USA



Georgia Institute of Technology®

Office of the President

December 6, 2017

Consejo Cultural Mundial
A. Postal 10.1083
Col. Lomas de Chapultepec
C.P. 11002 México, D.F.
MEXICO

Dear Selection Committee:

As the President of the Georgia Institute of Technology, I am privileged to nominate Dr. Seth Marder, Regents' Professor in Chemistry and Biochemistry, for the Albert Einstein World Award of Science. Dr. Marder's depth and breadth of accomplishments truly epitomize the values and the quality of our institution. His cutting-edge research program is a source of pride for us at Georgia Tech but is, more importantly, an example of excellence not only to colleagues in his field but to scientists worldwide.

Attached is a detailed nomination package highlighting several of Dr. Marder's most significant publications and achievements. Please do not hesitate to contact me if I can provide additional information about this outstanding candidate. I thank you for offering Dr. Marder your highest consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "G. P. Peterson", with a long horizontal line extending to the right.

G. P. "Bud" Peterson
President

Georgia Institute of Technology
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National Science Foundation Science & Technology Center on Materials and Devices
for Information Technology Research
University of Washington
Office of the Director

November 30, 2017

Interdisciplinary Committee for the Albert Einstein World Award of Science

Dear Committee Members:

It is my great pleasure to contribute a letter in support of the nomination of Professor Seth Marder for the Albert Einstein World Award of Science, as he is a truly outstanding candidate for this high honor. I have followed the career of Professor Marder from his graduate school days and can attest to the fact that he is a leading scientist and educator pioneering new fields of science. He was an important and crucial component of our NSF Science & Technology Center on Materials & Devices for Information Technology Research and he contributed greatly to its success.

Professor Marder is well known for his contributions to nonlinear optics, including two-photon absorbing and optical limiting materials and more recently for his contributions to organic electronics, third order nonlinear optical materials, and two-dimensional organic materials. When he arrived at Georgia Tech, he set out to build a program in all-optical switching materials, strengthen a program in organic electronics and begin to explore in detail how organic chemistry could be used to impact the field of surface science. In addition, due to his highly collaborative nature, he has developed many interactions with faculty in Physics, ECE, MSE, ChBE and ME. In this regard, his group has:

- developed new dyes for third-order nonlinear optics that have exceptionally large negative optical nonlinearities and nearly no linear or two photon absorption at telecommunication wavelengths. If such molecules can be made processible such that optical quality films of nearly neat materials can be formed, this could have a transformative impact on all-optical signal processing. Marder's group is now examining the fundamental factors that determine the length at which polymethine dyes desymmetrize (which will ultimately limit the size of achievable nonlinearities) and mechanisms to maximize the optical nonlinearity at this length (this work was published in *Science*). This work led to a call for MURI for which Marder put together a winning proposal and Georgia Tech was awarded a MURI (\$7.5M) for a Center for Organic Materials for All-optical Switching (COMAS).
- developed processible electron transport polymers and has been working to extend their absorption into the near infra-red for electronic and organic photovoltaic applications. In one approach, his group developed soluble conjugated perylene polymers, which are the first examples of any conjugated rylene (naphthalene, perylene, quaterylene, etc.) polymers. In another approach, they demonstrated that materials can have high mobilities and can be incorporated into an all polymer solar cells. Already this work has attracted considerable attention (the original paper on this published in the J. Am. Chem. Soc. in 2007 has over 400 citations) and other

groups have started developing related rylene polymers. In addition to this, they have performed systematic studies of electronic structure of important classes of electron transport materials including perylene, siloles, hexaazatrinaphthalene (HATNA) derivative, in collaboration with Antoine Kahn at Princeton who has performed PES and IPES studies, as well as Jean-Luc Brédas, who has performed electronic structure calculations.

- identified 19-electron metallocenes as effective materials for n-doping electron deficient organic semiconductors and p-dopants based on dithiolene complexes (which has received considerable industrial interest from companies around the world including funded programs by Samsung, Novaled (a subsidiary of Samsung), Mitsubishi, and by Sigma-Aldrich).

In the area of surface chemistry, he has moved into several new fields including thermochemical nanolithography in collaboration with Elisa Riedo, where they developed resists for creating surface patterns of carboxylic acids and amine, which can be further functionalized selectively to create patterns of multiple proteins, in collaboration with Jennifer Curtis. Georgia Tech has a patent issued on this work that was licensed to a start-up company. He has also developed dendritic surface chemistry, which enables one to greatly amplify the number of functional groups on a surface. In collaboration with Ken Sandhage, Marder has used this to functionalize diatoms such that they can be coated using a surface sol-gel technique to make various oxide coatings. Most of their work has been devoted to the development of a library of phosphonic acids for modification of metal oxides. They have used these phosphonic acids to tune the work function of ITO and zinc oxide, compatibilize metal oxide nanoparticle (with Joe Perry) and zeolites (with William Koros) in polymers to improve adhesion of polymer overlayers.

In a manner that is a testament to his interdisciplinary contributions to the scientific community, Professor Marder has been recognized by his peers by being elected a Fellow of AAAS, OSA, SPIE, APS, MRS, and the Royal Society of Chemistry. Professor Marder has published over 470 peer reviewed publications has, including over 20 in *Science*, *Nature* journals, *PNAS* and *Physical Review Letters*, an H-index of 89, over 37,000 citations, and over 55 papers having over 100 citations, and an average of over 74 citations per peer reviewed paper. Two of his original research papers surpassed being cited over 1250 times. He has given over 100 Plenary, Keynote Lectures, or Invited lectures at scientific conferences, 150 Lectures at Academic or Industrial Laboratories. He was appointed as a Guest Lecturer at Shanghai Jiaotong University, Huazhang University of Science & Technology, Anhui University and Wuhan University. He was an invited visiting Professor at the Ecole Normale Supérieure Cachan in 2009. The American Chemical Society also awarded him a 2011 ACS Cope Scholar Award.

Sincerely,



Larry Dalton

George B. Kauffman University Professor of Chemistry and Electrical Engineering
and B. Seymour Rabinovitch Chair Professor of Chemistry (Emeritus)



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Victor & Elizabeth Atkins Professor of Chemistry
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November 27, 17

Selection Committee
World Award of Science

Dear Committee Members:

I am pleased to support the nomination of Dr. Seth Marder of Georgia Tech for the **Albert Einstein "World Award of Science"**. I have known Marder for over 25 years and am quite familiar with his work. Dr. Marder has been the leader in the development a basic understanding of how structure determines the optical and electronic properties of organic materials. While he is best known for his work in the area of nonlinear optics he has also made substantial contributions in the area of organic electronics as well and has had a major impact on how material science in this area is pursued.

Seth Marder is a chemist who has focused on the construction of organic molecules that show interesting and useful optical properties and has aided in the development of the theory that has allowed such molecules to be designed and then prepared. He initially focused on the design and synthesis of molecules with large negative optical nonlinearities that are valuable in many practical applications. Marder's work has been well received by the scientific community not only for its predictive power, but also because it is presented in a manner that is widely accessible to the general materials community. Prior to his work, much of the work in the field was empirical and guided by simplistic concepts. Marder's work provided a firm basis for materials design and the prediction of optical properties. In a similar way, he has designed electron transport polymers with absorptions in the infrared to be used in photovoltaic applications. More recently he has turned to a number of areas of surface chemistry where he is using his organic chemical skills to prepare surfaces with potential applications in protein absorption and to tune the properties of the surface at the molecular level. As a result of the scientific community's appreciation of his work and his ability to articulate it to a wide audience, he has been elected to a number of professional societies and he has been invited to lecture in all the major symposia and organizations in his extended area of interests. His work has been widely cited has had a major impact on the field of optical materials. He has continued to make outstanding contributions to the use of organic materials in devices. Recently His group published a paper in **Nature Materials** that describes a very

chemical way to dope organic semiconductors to increase their conductivity. This approach that combines ideas from his background in inorganic and photochemistry opens whole new areas of applications of organic materials in electronics. His research combines creative fundamental science with an eye for the practical.

He has a strong commitment to increasing diversity in the scientific community and has lectured many times at minorities serving institutions, inner city high schools and he is currently a member of the Board of Governors of the National GEM consortium that is dedicated to advancing graduate education for under-represented minority students.

His work has had a profound impact not only on the nonlinear optical community but also on the chemistry community as a whole. He has provided a framework for understanding the fundamental interaction of electric fields with organic molecules, which is insightful, predictive and accessible to chemists of all backgrounds. His work spans from theory to synthesis and has set a very high bar for research in the area of organic materials.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert H. Grubbs". The signature is fluid and cursive, with the first name "Robert" and last name "Grubbs" clearly distinguishable.

Robert H. Grubbs

RHG/lc

RESUME - SETH R. MARDER

Grounds for the Nomination of Prof. Seth R. Marder for the World Award of Science

Summary. We are nominating Professor Seth R. Marder for the Albert Einstein World Award of Science in recognition of his seminal contributions to the fundamental understanding of the relationships between the chemical structure of organic molecules and their electronic and optical properties. Dr. Marder is the Georgia Power Chair in Energy Efficiency, and Regents' Professor in the School of Chemistry and Biochemistry and the School of Materials Science and Engineering. His work on the nonlinear polarizabilities and nonlinear absorptive properties of organic materials has had a profound impact on how the materials, chemistry, and physics communities think about the molecular basis for nonlinear optical responses and also on how materials scientists go about designing optimized structures for nonlinear optical (NLO) applications.

Marder's work in this area took the search for NLO chromophores, which was largely empirical and guided by simplistic concepts, to a level well founded in concepts of perturbation theory. His key insights are based upon the realization that bond length (order) alternation in polymethine dyes is a useful metric to correlate the degree of charge separation in the ground-state with linear and nonlinear polarizabilities. Marder's model allowed him to make specific predictions about the geometry required to optimize polarizability and hyperpolarizability factors, and to confirm these predictions experimentally. These predictions are now widely accepted worldwide. Marder and colleagues have also demonstrated that first and second molecular hyperpolarizabilities can be optimized in both a positive and negative sense, and have provided detailed information about the types of chemical structures required to obtain large and optimized hyperpolarizabilities. Marder has implemented his strategies for optimizing both second- and third-order NLO molecules to make molecules and materials with extremely large nonlinear coefficients.

Research: The Marder research program has focused on organic electronics, the development of all-optical switching materials, and on the molecular tailoring of surfaces and interfaces. His key discoveries are as follows.

- The Marder lab has developed new dyes for third-order nonlinear optics that have exceptionally large negative optical nonlinearities and nearly no linear or two photon absorption at telecommunication wavelengths. If such molecules can be made processible, such that optical quality films of nearly neat materials can be formed, this could have a transformative impact on all-optical signal processing. Marder's group is now examining the fundamental factors that determine the length at which polymethine dyes desymmetrize (limiting the size of achievable nonlinearities) and mechanisms to maximize the optical nonlinearity at this length. This work was published in 2010 in *Science* and led to the establishment of a multi-institutional research center. (See in particular papers 272, 285, 305, 315, 336, and 349 in his complete list of publications.)
- Marder and coworkers have developed solution- and vacuum-processible electron transport polymers and have been working to extend their absorption into the near infrared for electronic and organic photovoltaic applications. In one approach, his group developed the first examples of soluble conjugated perylene polymers, and in another they demonstrated that such materials can have high mobilities, incorporating them into all-polymer solar cells with efficiencies of about 1.5%. Already this work has attracted considerable attention (the original paper on this published in *J. Am. Chem. Soc.* in 2007 has over 400 citations) and

many other groups have started developing related perylene polymers. In addition to this, they have performed systematic studies of the electronic structures of important classes of electron transport materials including perylene, siloles, hexaazatrinaphthalene derivatives, in collaboration with experimentalists and theoreticians all over the world. (See papers 256, 266, 281, 289, 300, 301, 306, 313, 317, 321, 330, 342, 351, 364, 367.)

- The Marder lab has identified 19-electron metallocenes as effective materials for n-doping electron deficient organic semiconductors and molybdenum complexes for p-doping. This work has received considerable industrial interest from companies around the world including funded programs by Samsung, Mitsubishi, and Sigma-Aldrich. (See papers 264, 288, 302, 304, 331, 339, 354, 363, 369, 372, 380, 384.)
- Marder has developed approaches for the synthesis of organic electronic and photonic materials based on C-H functionalization chemistry, opening new structures and practical scale-up possibilities. (See papers 356, 379, 386, 389.)
- Marder's surface modification chemistry has produced several notable advances, including the use of phosphonic acid derivatives to tune electrode work functions, the understanding and tuning of the surface energy of materials to impact charge injection and collection between electrode and organic materials, and the development of chromophores for dye sensitized solar cells. (See papers 260, 265, 275, 278, 282, 284, 297, 312, 319, 332, 340, 341, 348, 373, 374, 375, 378.) New work from the Marder group in this general area includes the development of new thermochemical nanolithography techniques (papers 210, 220, 376), surface patterns of carboxylic acids and amine, which can be further functionalized selectively to create patterns of multiple proteins (papers 284, 376), and dendritic surface chemistry for functionalizing oxide surfaces (papers 215, 260, 319).

International Recognition: In recognition of his interdisciplinary contributions to the scientific community, Prof. Marder has been elected as a Fellow to several international communities (see CV attached). He has published over 450 peer-reviewed publications including more than 20 in *Science*, *PNAS*, *Phys. Rev. Lett.*, or *Nature* journals. His h-index is 89, with more than 37,000 citations, 79 papers having 100 citations or more, and an average of more than 74 citations per peer-reviewed paper. Two of his original research papers have been cited more than 1700 times. He has given more than 180 plenary, keynote, or invited lectures at national and international conferences, and more than 200 lectures at major academic or industrial laboratories, and has been appointed as Guest Lecturer or visiting Professor at several international universities. Since 2009, he has been a co-inventor on 39 issued or non-provisional patents. He has served on the editorial or international advisory boards of the *Journal of Materials Chemistry*, *Advanced Functional Materials*, *Chemistry of Materials*, *Chemical Communications*, and *Science* magazine. He was appointed by the RSC as founding Chair of the Editorial Advisory Board of their new top-tier materials journal *Materials Horizons*. The American Chemical Society honored Prof. Marder with a 2011 ACS Cope Scholar Award. In 2015, Prof. Marder received the Materials Research Society Mid-career Award.

Summary: Seth Marder's research career defines modern progress in the field of organic electronics, an area of critical importance to major problems in energy, consumer electronics, computing, and many other areas of science and industry. He is an outstanding scholar, educator, and mentor who has inspired many, and there are few who can match his record of interdisciplinary impact on the physical sciences worldwide.



SETH R. MARDER

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Appointments

7/16 – present	Director, Center on the Science and Technology of Advanced Materials and Interfaces (STAMI) funded by the Georgia Institute of Technology
9/15 – present	Co-Director, Army Research Office funded Multidisciplinary University Research Initiative (MURI) Center for Advanced 2D Organic Networks
7/14 – present	Director, Office of Naval Research funded MURI Center for Advanced Organic Photovoltaics (CAOP)
10/12 – 8/15	Co-Director, Materials Research Science and Engineering Center, Georgia Institute of Technology (GT), Atlanta, GA
8/11 – present	Regents' Professorship, GT
1/11 – present	Associate Director, Center for Organic Photonics and Electronics (COPE), GT
10/10 – 3/16	Director, Air Force Office of Sponsored Research funded MURI Center for Organic Materials for All Optical Switching (COMAS)
1/10 – present	Georgia Power Chair in Energy Efficiency, GT
1/10 – 12/10	Co-Director, Center for Organic Photonics and Electronics, GT
9/09 – 7/14	Associate Director, Department of Energy funded Energy Frontier Research Center: Center for Interface Science: Hybrid Electric Materials Georgia Institute of Technology
8/05 – 7/13	Deputy Director, National Science Foundation (NSF) funded Science and Technology Center for Materials and Devices for Information Technology Research
5/04 – present	Professor of Materials Science and Engineering (courtesy), GT
8/03 – present	Professor of Chemistry, GT
8/03 – 12/09	Founding Director, Center for Organic Photonics and Electronics, GT
8/99 – 7/03	Professor of Optical Sciences, University of Arizona, Tucson, AZ
9/98 – 7/03	Professor of Chemistry, University of Arizona, Tucson, AZ
10/90 – 9/98	Member of the Beckman Institute, California Institute of Technology, Pasadena, CA
5/89 – 9/98	Member of the Technical Staff, Optoelectronics Materials Group, The Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

Education

B.A. 1981	Massachusetts Institute of Technology	Chemistry
Ph.D. 1985	University of Wisconsin at Madison	Chemistry
9/85 – 7/87	University of Oxford, England (postdoc)	
7/87 – 11/88	Jet Propulsion Laboratory, California Institute of Technology (postdoc)	

Honors and Awards (selected)

2016 Elected Fellow, National Academy of Inventors;

2015 Materials Research Society Mid-Career Award;

2014 Outstanding Faculty Research Author Award, Georgia Tech;

Elected Fellow Materials Research Society, 2014;

Materials Awards at the GTRC Award for Excellence in Research, awarded on behalf of the COPE Industry Engagement and Technology Transfer, 2011;

American Chemical Society Arthur C. Cope Scholar Award, 2010;

Elected Co-Vice Chair of 2012;

Gordon Research Conference of Electronic Processes in the Organic Solid State and Co-Chair of 2014;

2009 Outstanding Award in Research Program Development, Georgia Tech, 2008;

Elected Fellow, American Physical Society, 2008;

Elected Fellow, Royal Society of Chemistry, 2007;

Elected Fellow, Society of Photo-Optical Instrumentation Engineers (SPIE), 2007;

Elected Fellow, Optical Society of America; Elected Fellow, American Association for the Advancement of Science, 1997 – 1999;

NSF Special Creativity Award Extension, 1995;

1993 Lew Allen Award for Research, Jet Propulsion Laboratory (JPL), 1987 – 1988;

National Research Council Resident Research Associate, JPL, 1984 – 1985.

Journal Editorship

Member, Board of Reviewing Editors, *Science*, 1995-1999 Member, Editorial Board, *Chemistry of Materials*, 1995–2000, Guest Editor, Special Issue Advanced Functional Materials, 2001, Member, Editorial Board *Nonlinear Optics*, *Quantum Optics*, 2003–present, Member, Editorial Advisory Board, *Chemical Communications*, 2006–2009, Member, Editorial International Board, *Journal of Materials Chemistry*, 2007–2011, Member, Editorial Advisory Board, *Advanced Functional Materials*, 2008–present, Guest Editor, Special Issue *Journal Materials Chemistry*, 2009, Co-Guest Editor, Special Issue *Chemistry of Materials*, 2011, Chair, Editorial Board, Royal Society of Chemistry, *Journal of Materials Chemistry*, 2011, Member, Editorial Advisory Board, *Journal of Organic Photonics and Photovoltaics*, 2012–present, Chair, Editorial Board, Royal Society of Chemistry, *Materials Horizons*, 2013–present, Member, Advisory Board, Royal Society of Chemistry, *Journal of Materials Chemistry C*, 2013–present.

Synergistic Activities (selected)

[1] Over 37,000 citations, with an h-index of 89 and an average citation per paper of over 74 for peer reviewed papers, including more than 470 research publications and 39 granted patents;

[2] Founding Chair of the Editorial Board for *Materials Horizons*, 2013 – present;

[3] Member of the NSF Optics and Photonics Subcommittee of the Mathematics and Physical Sciences Advisory Committee, 2013 – 2014;

[4] Member of the US Department of Commerce Emerging Technology and Research Advisor Committee (ETRAC), appointed by the Secretary of Commerce, 2008 – 2012;

[5] Helped to organize over 65 scientific conferences.

Books (selected)

- [1] "Materials for Nonlinear Optics: Chemical Perspectives." S. R. Marder, J. W. Sohn, G. D. Stucky, eds. American Chemical Society, *ACS Symposium Series*, Washington, D.C., **455** (1991)
- [2] "Organic, Metal-Organic, Polymeric Materials for Nonlinear Optical Applications." S. R. Marder and J. W. Perry, eds., *Proc. SPIE-Int. Soc. Opt. Eng.*, Bellingham, WA, **2143** (1994)
- [3] "Thin Films for Integrated Optics Applications." B. W. Wessels, S. R. Marder, D. W. Walba, eds., Materials Research Society, Pittsburgh, PA. *Mater. Soc. Symp. Proc.* **392** (1995)
- [4] "Special Issue on Organic for Photonics." N. Peyghambarian, S. Marder, Y. Koike, A. Persoons, eds., *IEEE Journal of Selected Topics in Quantum Electronics* **7** (5), 757 (2001)
- [5] "Special Issue on Organic Electronics and Photonics." J. L. Brédas and S. R. Marder, eds. *Advanced Functional Materials* **12**, (2002)
- [6] "Photoresponsive Polymers I." S. R. Marder K. S. Lee, eds., *Adv. Polym. Sci.* **213** (2008)
- [7] "Photoresponsive Polymers II." S. R. Marder K. S. Lee, eds., *Adv. Polym. Sci.* **214** (2008)
- [8] "Themed Issue: Nonlinear Optics." S. R. Marder, ed., *Journal of Materials Chemistry* **19** (40), 7392-7393 (2009)
- [9] T. Parker and S. Marder, "Synthetic Methods in Organic Electronic and Photonic Materials: A Practical Guide." RSC Publishing, (2015). ISBN: 978-1-84973-986-3
- [10] "The WSPC Reference on Organic Electronics: Organic Semiconductors." Volume 1: Basic Concepts; Volume 2: Fundamental Aspects of Materials and Applications. J. L. Brédas and S. R. Marder, eds. *Materials and Energy* **7**, (2016). ISBN: 978-981-4699-22-8

Granted U.S. Patents (selected)

- [1] "Two-Photon or Higher-Order Absorbing Optical Materials and Methods of Use." S. R. Marder and J. W. Perry, U.S. Patent 6,267,913, filed November 7, 1997, awarded July 31, 2001. (www.google.com/patents/US6267913)
- [2] "Two-Photon or Higher-Order Absorbing Optical Materials for Generation of Reactive Species." B. Cumpston, M. Lipson, S. R. Marder, J. W. Perry, U.S. Patent 6,608,228, filed April 15, 1999, awarded August 19, 2003 (<https://www.google.com/patents/US6608228>).
- [3] "Two-Photon or Higher-Order Absorbing Optical Materials and Methods of Use." S. R. Marder and J. W. Perry, U.S. Patent 8,197,722, filed July 30, 2001, awarded June 12, 2012. (www.google.com/patents/US8197722)
- [4] "Two-Photon or Higher-Order Absorbing Optical Materials for Generation of Reactive Species." B. Cumpston, M. Lipson, S. R. Marder, J. W. Perry, U.S. Patent 7,235,194, filed May 20, 2003, awarded June 26, 2007 (<https://www.google.com/patents/US7235194>). (Licensed)
- [5] "Method for Patterning Metal Using Nanoparticle Containing Precursors." J. W. Perry, S. R. Marder, F. Stellacci, US Patent 7,252,699, filed December 17, 2001, awarded August 7, 2007. (<https://www.google.com/patents/US7252699>). PCT Int. Appl. US2001/047724 filed December 17, 2001.
- [6] "Method for Patterning Metal Using Nanoparticle Containing Precursors." Joseph W. Perry, Seth R. Marder, Francesco Stellacci, U.S. Patent 8,557,017, filed October 23, 2009, awarded October 15, 2013. (www.google.com/patents/US8557017)
- [7] "Method for Patterning Metal Using Nanoparticle Containing Precursors." Joseph W. Perry, Seth R. Marder, Francesco Stellacci, U.S. Patent 8,779,030, filed April 18, 2007, awarded July 15, 2014. (www.google.com/patents/US8779030)

Papers (selected)

1. "Approaches for Optimizing the First Electronic Hyperpolarizability of Conjugated Organic Molecules." S. R. Marder, D. N. Beratan, L.-T. Cheng, *Science* **252**, 103-106 (1991)
2. "Large First Hyperpolarizabilities in Push-Pull Polyenes by Tuning of the Bond Length Alternation and Aromaticity." S. R. Marder, L.-T. Cheng, B. G. Tiemann, A. C. Friedli, M. Blanchard-Desce, J. W. Perry, J. Skindhøj, *Science* **263**, 511-514 (1994)
3. "A Unified Description of Linear and Nonlinear Polarization in Organic Polymethine Dyes." S. R. Marder, C. B. Gorman, F. Meyers, J. W. Perry, G. Bourhill, J.-L. Brédas, B. M. Pierce, *Science* **265**, 632-635 (1994)
4. "Design of Organic Molecules with Large Two-Photon Absorption Cross Sections." M. Albota, D. Beljonne, J.-L. Brédas, J. E. Ehrlich, J.-Y. Fu, A. A. Heikal, S. E. Hess, T. Kogej, M. D. Levin, S. R. Marder, D. McCord-Maughon, J. W. Perry, H. Röckel, M. Rumi, G. Subramaniam, W. W. Webb, X.-L. Wu, C. Xu, *Science* **281**, 1653-1656 (1998)
5. "Two-Photon Polymerization Initiators for Three-Dimensional Optical Data Storage and Microfabrication." B. H. Cumpston, S. P. Ananthavel, S. Barlow, D. L. Dyer, J. E. Ehrlich, L. L. Erskine, A. A. Heikal, S. M. Kuebler, I.-Y. S. Lee, D. McCord-Maughon, J. Qin, H. Röckel, M. Rumi, X.-L. Wu, S. R. Marder, J. W. Perry, *Nature* **398**, 51-54 (1999)
6. "Structure-Property Relationships for Two-Photon Absorbing Chromophores Bis-Donor Diphenylpolyene and Bis(stryl)Benzene Derivatives." M. Rumi, J. E. Ehrlich, A. A. Heikal, J. W. Perry, S. Barlow, Z. Hu, D. McCord-Maughon, H. Röckel, S. Thayumanavan, S. R. Marder, D. Beljonne, J.-L. Brédas, *J. Am. Chem. Soc.* **122**, 9500-9510 (2000)
7. "An Efficient Two-Photon-Generated Photoacid Applied to Positive-Tone 3D Microfabrication." W. Zhou, S. M. Kuebler, K. L. Braun, T. Yu, J. K. Cammack, C. K. Ober, J. W. Perry, S. R. Marder, *Science* **296**, 1106-1109 (2002)
8. "High Electron Mobility in Room-temperature Discotic Liquid-crystalline Perylene Diimides." Z. An, J. Yu, S. C. Jones, S. Barlow, S. Yoo, B. Domercq, P. Prins, L. D. A. Siebbeles, B. Kippelen, S. R. Marder, *Adv. Mater.* **17**(21), 2580-2583 (2005)
9. "A High-Mobility Electron-Transport Polymer with Broad Absorption and its Use in Field-Effect Transistors and All-Polymer Solar Cells." X. Zhan, Z. Tan, B. Domercq, Z. An, X. Zhang, S. Barlow, Y. Li, D. Zhu, B. Kippelen, S. R. Marder, *J. Am. Chem. Soc.* **129** (23), 7246-7247, (2007)
10. "Design of Polymethine Dyes with Large Third-Order Optical Nonlinearities and Loss Figures of Merit." J. M. Hales, J. Matichak, S. Barlow, S. Ohira, K. Yesudas, J.-L. Brédas, J. W. Perry, S. R. Marder, *Science* **327** (5972), 1485-1488 (March 2010, DOI: 10.1126/science.1185117)

List of Publications for Seth R. Marder (as of November 17, 2017)

Journals

1. "HPLC Determination of Erthyorbate in Cured Meats." K. Lee, S. R. Marder, *J. Food Sci.* **48**, 306-307 (1983, DOI: [10.1111/j.1365-2621.1983.tb14863.x](https://doi.org/10.1111/j.1365-2621.1983.tb14863.x))
2. "Reactions of a Cationic Bridging Methylidyne-Iron Complex with Carbon Monoxide and with Alkenes." C. P. Casey, P. J. Fagan, W. M. Miles, S. R. Marder, *J. Mol. Catal.* **21**, 173-188 (1983, DOI: [10.1016/0304-5102\(93\)80118-E](https://doi.org/10.1016/0304-5102(93)80118-E))
3. "Rearrangement of Bridging Alkylidyneiron Complexes to Bridging Alkenyliron Complexes." C. P. Casey, S. R. Marder, P. J. Fagan, *J. Am. Chem. Soc.* **105**, 7197-7198 (1983, DOI: [10.1021/ja00362a044](https://doi.org/10.1021/ja00362a044))
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