Minh Tuan Trinh, Ph.D.

Optics and Photonics, Electrical Engineering and Computer Science
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EMPLOYMENT HISTORY

University of Michigan, Assistant Research Scientist **1/2017 - present**
Columbia University, Postdoc, and then Associate Research Scientist **1/2013 - 12/2016**
University of Texas at Austin, Postdoc **8/2012 - 12/2012**
University of Amsterdam, Postdoc **7/2010 - 8/2012**

Research Interests: Nonlinear optics and ultrafast spectroscopy, nanostructured materials, photovoltaics, physical chemistry, 2D materials, magnetic materials, and quantum information processing and photonic devices.

EDUCATION

Ph.D. in Materials Science, Department of Chemical Engineering **2006 - 2010**
Delft University of Technology, Delft, the Netherlands
(Ranked #52 and #58 by the QS and Times Higher Education World Rankings)

M.S. in Nonlinear Optics and Optical Materials, Department of Physics **2002 - 2005**
Chungbuk National University, Cheongju, South Korea

B.S. in Quantum Optics, Department of Physics **1998 - 2002**
College of Natural Science, Vietnam National University, Hanoi, Vietnam

RESEARCH EXPERIENCE

Published 48 papers, four in *Nature* research journals, three in *Science Advances*, six in *Nano Letters*, and eight in *Journal of the American Chemical Society.* Total citations: 3,800+, h-index = 25.

University of Michigan, Ann Arbor, MI **1/2017 - present**

Department of Electrical Engineering and Computer Science, Center for Dynamic Magneto-Optics, advisor Prof. Stephen Rand.

- Construction and management of a lab with a femtosecond pulse and carrier-envelope-phase (CEP) stabilized laser system, designed and performed experiments on nonlinear magneto-optics effects.
- Leading research in nonlinear optics, magneto-optic phenomena with relevance to electromagnetic energy conversion, magnetic dipole scattering, and THz generation.
- First experimentally observed Stokes-shifted librations and vibrations driven by femtosecond magneto-electric interactions in molecular level, which is the result of the conversion from orbital angular momentum to molecular rotation under optical magnetic torque.
- Designed and developed an ultrafast tilted-wavefront pump-probe setup for the crossbeam geometry with a high temporal resolution.

Columbia University, New York, NY **1/2013 - 12/2016**

Department Chemistry, Advisor: Prof. Xiaoyang Zhu; Active user at the Center for Functional Nanomaterials, Brookhaven National Laboratory, New York.

- Super-atom solids: Synthesized and studied physical properties of a new class of materials made of atomically precise nanoclusters (super-atoms). Desirable physical properties of these materials such as tunable bandgap semiconducting, magnetic, and thermal and electric transporting can be

achieved by engineering the corresponding properties in the building blocks, chemical intercalation, and manipulate their coupling via ligands.

- Lead-halide Perovskites: Contributed to a deeper understanding of photo-physical properties of Lead-halide Perovskite, a promising material for a low cost and highly efficient solar cell. Provided first direct evidence for hole traps on the surfaces and exciton trap states below gap of 2D and 3D perovskite crystals using ultrafast spectroscopies. Demonstrated the dependence of the density of trap states on the chemical compositions for 3D perovskite crystals. Studied the role of organic cations on the extraordinary physical properties of band-edge carriers and their charge carrier nature. Directly probed large polarons formation after photo-excitation rather than exciton or free carrier formation using ultrafast spectroscopic techniques.
- Non-fullerene Organic Photovoltaics (OPV): Demonstrated the high performance of non-fullerene OPV based on helical molecular semiconductors with a record power conversion efficiency > 8.3 % at the time. Probed ultrafast electron and hole transfer (sub-picosecond) and charge separation upon photo-excitation with a high charge yield contributed from both the donor and acceptor.
- Non-fullerene Organic Photodiodes (OPD): Demonstrated the high performance of OPD using a rigid and conjugated macrocycle as the electron acceptor. Determined that the high OPD performance comes from a very low dark current and an efficient ultrafast electron/hole transfer at the interfaces.
- Singlet Fission (SF): First demonstrated intra- to intermolecular SF in oligoene molecules with different conjugation lengths (SF has great potential for highly efficient OPV applications). Discovered a strongly correlated triplet pair from intramolecular SF in bipentacene molecules and harvested triplet excitons in bipentacene molecule by a covalently coupled iron-oxide cluster. The study has been done using ultrafast spectroscopies on different molecular designs.
- Small Conjugated Organic Molecules: Discovered ultrafast intersystem crossing in oligodiacetylene co-micelles and demonstrated efficient blue-emitting cyclostilbenes for organic light-emitting diode (OLED) applications. Investigated ultrafast exciton dynamics in covalent donor-acceptor molecules.
- Nanostructured Graphene: Demonstrated efficient many-body interactions in graphene quantum dots and negligible many-body interactions in graphene nanoribbons. Simulated Auger recombination in graphene quantum dots using the stochastic model.
- Inorganic Quantum Dots (QDs): First proved that hot carriers break the QD symmetry and resulted in the transient Stark effect in the optical transitions.

University of Amsterdam, the Netherlands. **2010 - 2012**

Institute of Physics (Van der Waals Zeeman Institute); Advisor: Prof. Tom Gregorkiewicz.

- First demonstrated the direct multiple exciton generation in coupled Si nanocrystals embedded in a SiO_2 matrix upon absorption a single high-energy photon using ultrafast spectroscopies, which could be applied to create high efficiency silicon solar cells.
- Revealed the free charge nature of Auger recombination in Si nanocrystals.
- Studied the optical properties of Si nanocrystals and rare-earth ion doped Si nanocrystals using ultrafast pump-probe and photoluminescence spectroscopy (at room and cryogenic temperatures), and energy transfer from Si nanocrystals to rare-earth ions.
- Grew Si nanocrystals embedded in SiO_2 by radio-frequency co-sputtering followed by high-temperature annealing.

Delft University of Technology, the Netherlands **2006 - 2010**

Department of Chemical Engineering. Foundation for Fundamental Research on Matter (FOM) Research Fellow, Optoelectronic Materials group; Advisor: Prof. Laurens Siebbeles;

- Developed a versatile femtosecond transient absorption setup that is able to measure both ground and excited state absorptions, ultralow signal level, and able to probe at the pump energy degeneracy and built an optical pump-THz probe setup.
- Proved the existence of multiple exciton generation (MEG) in PbSe quantum dots. Demonstrated the anomalous independence of MEG yield on different group IV-VI quantum dot architectures.
- Studied ultrafast exciton/carrier dynamics in quantum dots. Provided evidence that resolved the controversy in the assignment of the optical transitions in PbSe quantum dots.
- Studied the ultrafast dynamics of excitons and charges in polythiophene P3HT/ PCBM bulk heterojunction using ultrafast transient absorption spectroscopy.
- Synthesized PbSe nanocrystals by the hot injection method (wet chemical synthesis).

TEACHING AND MENTORING EXPERIENCE

University of Michigan **2017 - present**

- Taught several full lectures of *Electro-magnetic Waves* for graduate students on behalf of Prof. Stephen Rand, the University of Michigan, Spring and Fall 2018.
- Supervising two undergraduate students in the project of THz generation and THz refractive index measurement of organic materials.
- Supervising three graduate students in projects related to laser cooling and magneto-electric effects.
- Educated middle school students at Slauson Middle School, Ann Arbor about optical phenomenon during a daylong science outreach event.

Columbia University **2013 - 2016**

- Taught *Math and Science* weekly as a volunteer teacher for a class of ~ 20 students, Community Impact at Columbia University, Summer and Fall 2016.
- Taught several full lectures of *Quantum Chemistry* for undergraduate students on behalf of Prof. Benjamin Bostick at Barnard College, Columbia University, 2016.
- Supervised four Ph.D. students in projects related to the ultrafast carrier/exciton dynamics in lead halide perovskites, growing super-atom solids and IR spectroscopic study of these materials, photo-physics of donor-acceptor molecules, and organic semiconducting devices.
- Supervised an undergraduate student in the MRSEC outreach summer program 2015.

University of Amsterdam **2010 - 2012**

- Supervised two master's students in studying space separated carrier multiplication in Si quantum dots and hot carrier emission under cryogenic conditions.

Delft University of Technology **2006 - 2010**

- Supervised two master's students in projects about carrier multiplication in core/shell quantum dots and ultrafast exciton/charge dynamics in nanostructured materials.
- Served as a teaching assistant in a course on spectroscopy and nanostructured materials.

Chungbuk National University **2002 - 2005**

- Supervised three undergraduate students in projects about holographic recording in photorefractive materials, three-dimensional data storage in photorefractive polymers, and rare-earth doped glasses by two-photon absorption.
- Served as a teaching assistant in a course on general and experimental physics.
- Taught general sciences for middle school students.

Vietnam National University **1998 - 2002**

- Tutored middle and high school students in physics and mathematics.

AWARDS

- Awarded research grant (co-PI) "Highly efficient wavelength division multiplexer using nanostructured plasmonic waveguides for optical communication". Vietnam National Foundation for Science and Technology Development (NAFOSTED), ~ $35k, (2018-2019).
- Dutch Foundation for Fundamental Research on Matter (FOM) grant for the doctoral research study, the Netherlands (2006-2010). ~ EUR 140k for 4 years.
- Ranked #1 with the highest scores in the master's courses, Chungbuk National University, South Korea (2002-2004).
- Brain Korea 21 (BK21) scholarship for graduate study (2002-2005).
- Toyota Scholarship for top 5 students in the Physics Department, Vietnam National University, Hanoi (2002).
- 1st prize in National Olympic of Physics for University Students (1999).

PROFESSIONAL DEVELOPMENT

- "Teaching Development" at the University of Michigan **Fall 2017**
- "The Essentials of Teaching and Learning" at Columbia University **10 - 12/2016**
- "Individual Development Plan (IDP) Program" at Columbia University **2014, 2016**
- "Transitioning to Research Independence" at Columbia University **7 - 9/2015**
- "Fundamentals of Teaching" at Columbia University **4 - 6/2015**
- "Grant Writing Workshop" at Columbia University and NYC ASCENT **9/2015**
- "Leadership Program" by Cornell University and the NYC ASCENT **4/2015**

ACADEMIC SERVICES

- Reviewer for *Nano Letters, Light: Science & Application* (Nature PG), *Scientific Report* (Nature PG), *ACS Photonics, Advanced Materials, Nanoscale, The Journal of Physical Chemistry, IEEE Access, Journal of Vacuum Science and Technology, CrystEngComm, Materials* (MDPI), *Journal of Science: Advanced Materials and Devices*, and the *Journal of Electronic Materials.*
- Member of the American Association for the Advancement of Science (AAAS).
- Member of the American Physical Society (APS).
- Chaired the Solar Energy morning session at the Energy and Materials Research conference (EMR), in June 2012, at Torremolinos, Malaga, Spain.
- During my time at Columbia University, I assisted the PI in writing and reviewing NSF and DOE grant proposals.

PATENTS

ORGANIC SEMICONDUCTOR COMPOUNDS AND METHODS OF USE. C. Nuckolls, Y. Zhong, R. Chen, B. Kumar, **M.T. Trinh**, W. Wang, C. Nam, M.Y. Sfeir, M. L. Steigerwald, X.-Y. Zhu, S. Xiao, F. Ng. WO patent: WO2015171640 A1. (2015). U.S. patent: US 2017/0186961 A1

PUBLICATIONS

Total citations = 3,800+, exceeding 1,000 citations per year as of 2017, and h-index = 25 in Google Scholar, four papers in *Nature* research journals, three in *Science Advances*, six in *Nano Letters*, and eight in *Journal of the American Chemical Society*.

Selected Publications (underlines are the students that I directly mentored)

1. **M.T. Trinh**, A. Pinkard, A. Pun, S. Sanders, M. Sfeir, L. Campos, X. Roy, X.-Y. Zhu. Distinct Properties of the Triplet Pair State from Singlet Fission. *Science Advances,* **3** (7), e1700241 (2017).
2. E. O'Brien, **M.T. Trinh**, R. Kann, J. Chen, G. Elbaz, A. Masurkar, T. Atallah, M. Paley, N. Patel, D. Paley, E. Doud, A. Crowther, I. Kymissis, A. Millis, D. Reichman X-Y. Zhu, X. Roy. Single-crystal to singlet-crystal intercalation of a low-bandgap super-atomic crystal *Nature Chemistry,* **9**, 1170 (2017).

3. K. Miyata, D. Meggiolaro, **M.T. Trinh**, P. Joshi, E. Mosconi, S. Jones, F. De Angelis, X-Y. Zhu.
Large Polarons in Lead Halide Perovskites.
Science Advances, **3** (8), e1701217 (2017).

4. H. Zhu, **M.T. Trinh**, J. Wang, Y. Fu, P. Joshi, K. Miyata, S. Jin, X.-Y. Zhu.
Organic Cations are Not Essential to the Remarkable Properties of Band Edge Carriers in Lead Halide Perovskites.
Advanced Materials, **29**, 1603072 (2017).

5. B. Zhang, **M.T. Trinh**, B. Fowler, M. Ball, Q. Xu, F. Ng, M. Steigerwald, X.-Y. Zhu, C. Nuckolls, Y. Zhong.
Rigid, Conjugated Macrocycles for High Performance Organic Photodetectors
Journal of the American Chemical Society, 138, 16426 (2016).

6. L. Zhu, **M.T. Trinh**, L. Yin, Z. Zhang.
Sequential Oligodiacetylene Formation for Progressive Luminescent Color Conversion via Co-Micellar Strategy
Chemical Science, **7**, 2058 (2016).

7. **M.T. Trinh**, X. Wu, D. Niesner, X.-Y. Zhu
Many-Body Interactions in Photo-Excited Lead Iodide Perovskite
Journal of Materials Chemistry A, **3**, 9285 (2015).

8. Haiming Zhu, Yongping Fu, Fei Meng, Xiaoxi Wu, Zizhou Gong, Qi Ding, Martin Gustafsson, **M.T. Trinh**, Song Jin, X.-Y. Zhu.
Lead Halide Perovskite Nanowire Lasers with Low Lasing Thresholds and High Quality factors
Nature Materials, **14**, 636 (2015).

9. Y. Zhong, **M.T. Trinh**, R. Chen, G. Purdum, P. Khlyabich, M. Sezen, S. Oh, H. Zhu, B. Fowler, B. Zhang, W. Wang, C. Nam, M. Sfeir, C. Black, M. Steigerwald, Y. Loo, F. Ng, X-Y. Zhu, C. Nuckolls.
Molecular Helices as Electron Acceptors in High-Performance Bulk Heterojunction Solar Cells
Nature Communication, **6**, 8242 (2015).

10. Q. Chen, **M.T. Trinh**, D. Paley, M. Preefer, H. Zhu, B. Fowler, X.-Y. Zhu, M. Steigerwald, C. Nuckolls.
Strain-Induced Stereoselective Formation of Blue-Emitting Cyclostilbenes
Journal of the American Chemical Society, **127**, 12282 (2015).

11. **M.T. Trinh,** Y. Zhong, Q. Chen, T. Schiros, S. Jockusch, M. Sfeir, M. Steigerwald, C. Nuckolls, and X.-Y. Zhu.
Intra- to Intermolecular Singlet Fission
Journal of Physical Chemistry C, **119**, 1312 (2015).

12. X. Wu, **M.T. Trinh**, D. Niesner, H. Zhu, Z. Norman, J. Owen, O. Yaffe, X.-Y. Zhu
Trap States in Lead Iodide Perovskites.
Journal of the American Chemical Society, **137**, 2089 (2015).

13. Y. Zhong, **M.T. Trinh**, R. Chen, W. Wang, P. Khlyabich, B. Kumar, Q. Xu, C. Nam, M. Sfeir, C. Black, M. Steigerwald, Y. Loo, S. Xiao, Fay Ng, X.-Y. Zhu, C. Nuckolls.
Efficient Organic Solar Cells with Helical Perylene Diimide Electron Acceptors.
Journal of the American Chemical Society, **136**, 15215 (2014).

14. **M.T. Trinh**, M. Sfeir, J. Choi, J. Owen, and X-Y. Zhu.
A hot electron-hole pair breaks the symmetry of a semiconductor quantum dot.
Nano Letters, **13**, 6091 (2013).

15. **M.T. Trinh**[*], R. Limpens, T. Gregorkiewicz. ([*] corresponding author).
Experimental and modeling study of Auger recombination in silicon nanocrystals.
Journal of Physical Chemistry C, **117**, 5963 (2013).

16. **M.T. Trinh**[*], R. Limpens, W. de Boer, J. Schins, L. Siebbeles, T. Gregorkiewicz[*].
([*] corresponding author).

Direct generation of multiple excitons in adjacent Si nanocrystals revealed by ultrafast induced absorption.
Nature Photonics, **6**, 316 (2012). Highlighted in the News and Views: A. J. Nozik, Photovoltaics: Separating multiple excitons, *Nature Photonics* 6, 272 (2012).

17. **M.T. Trinh**, L. Polak, J. Schins, A. Houtepen, R. Vaxenburg, G. Maikov, G. Grinbom, A. Midgett, J. Luther, M. Beard, A. Nozik, M. Bonn, E. Lifshitz, L. Siebbeles.
Anomalous independence of multiple exciton generation on different group IV-VI quantum dot architectures.
*Nano Letters***, 11**, 1623 (2011).

18. J. Schins, **M.T. Trinh**, A. Houtepen, L. Siebbeles.
Probing formally forbidden optical transitions in PbSe nanocrystals by time- and energy-resolved transient absorption spectroscopy.
Physical Review B, **80**, 035323 (2009).

19. **M.T. Trinh**, A. Houtepen, J. Schins, J. Piris, L. Siebbeles.
Nature of the second optical transition in PbSe nanocrystals.
Nano Letters, **8**, 2112, (2008).

20. **M.T. Trinh**, A. Houtepen, J. Schins, T. Hanrath, J. Piris, W. Knulst, A. Goossens, L. Siebbeles.
In spite of recent doubts carrier multiplication does occur in PbSe nanocrystals.
Nano Letters, **8**, 1713 (2008).
(Top 20 most cited paper by Nano Letters, as of 2011).

Other Publications

21. E. de Jong, H. Rutjes, J. Valenta, **M.T. Trinh**, A. Poddubny, A. Gert, I. Yassievich, T. Gregorkiewicz
Thermally stimulated exciton emission in Si nanocrystals.
Light: Science & Applications (Nature PG), **7**, 17133 (2018).

22. C. D. Truong, H. T. Nguyen, **M. T. Trinh**, K. Vu
Three-Mode Multiplexer and Demultiplexer Utilizing Trident and Multimode Couplers
Optics Communications (2018, in press).

23. K. Makhal, **M.T. Trinh**, E. Dreyer, S. Rand
Evidence of Magnetic Torque Dynamics in Optically-induced Magnetization
Frontiers in Optics, FM4B.5 (2018).

24. **M.T. Trinh**, K. Makhal, E. Dreyer, S. Rand
Optical Magnetic Force Induces Molecular Rotations
CLEO: QELS,_Fundamental Science, FF2E. 7 (2018).

25. X. Wu, L. Tan, K. T. Hu, X, Shen, K. Miyata, **M.T. Trinh**, S. Liu, D. Egger, R. Li, R. Coffee, S. Liu, D. Egger I. Makasyuk, Q. Zheng, A. Fry, J. Robinson, X. Wang, L. Kronik, X.-Y. Zhu, A. Rappe, A. Lindenberg
Light-induced picosecond rotational disordering in hybrid organic-inorganic perovskites.
Science Advances, **3**(7): e1602388 (2017).

26. T. Sisto, Y. Zhong, B. Zhang, **M.T. Trinh**, K. Miyata, X. Zhong, X.-Y. Zhu, M. Steigerwald, F. Ng, C. Nuckolls.
Long, Atomically Precis Donor-Acceptor Cove-Edge Nanoribbons as Electron Acceptors.
Journal of the American Chemical Society, Comm. **139**, 5648 (2017).

27. M Truong, **M.T. Trinh**, H. Dang, V. Nguyen.
Numerical investigation of polarization insensitive two-mode division (De)multiplexer based on an asymmetric directional coupler.
Photonics and Nanostructures, invited paper, **23**, 50 (2017).

28. D. Niesner, H. Zhu, K. Miyata, P. Joshi, T. Evans, B. Kudisch, **M.T. Trinh**, M. Marks, X. Zhu.
Persistent Energetic Electrons in Methylammonium Lead Iodide Perovskite Thin Films.

Journal of the American Chemical Society, **138**, 15717 (2016).

29. T. Hu, M. Smith, E. Dohner, M. Sher, X. Wu, **M.T. Trinh**, A. Fisher, J. Corbett, X-Y. Zhu, H. Karunadasa, and A. Lindenberg.
Mechanism for Broadband White-Light Emission from Two-Dimensional (110) Hybrid Perovskites.
*Journal of Physical Chemistry Letters***,** 7, 2258 (2016).

30. B. Choi, J. Yu, D. Paley, **M.T. Trinh**, M. Paley, J. Karch, A. Crowther, C. Lee, R. Lalancette, X-Y. Zhu, P. Kim, M. Steigerwald, C. Nuckolls, X. Roy.
Van der Waals Solids from Self-Assembled Nanoscale Building Blocks.
*Nano Letters***, 16**, 1445 (2016).

31. X. Wu, **M.T. Trinh**, X.-Y. Zhu.
Excitonic Many-Body Interactions in Two-Dimensional Lead Iodide Perovskite Quantum Wells
Journal of Physical Chemistry C, **119**, 14714 (2015).

32. S. Sanders, E. Kumarasamy, A. Pun, **M.T. Trinh**, B. Choi, J. Xia, E. Taffet, J. Low, J. Miller, X. Roy, X-Y. Zhu, M. Steigerwald, M. Sfeir, L. Campos.
Quantitative Intramolecular Singlet Fission in Bipentacenes.
Journal of the American Chemical Society, **137**, 8965 (2015).

33. Y. Zhong, B. Kumar, S. Oh, **M.T. Trinh**, Y. Wu, K. Elbert, P. Li, X. Zhu, S. Xiao, F. Ng, M. Steigerwald, C. Nuckolls.
Helical Ribbons for Molecular Electronics.
Journal of the American Chemical Society, **136**, 8122 (2014).

34. V. Svrcek, K. Dohnalova, D. Mariotti, **M.T. Trinh**, R. Limpens, S. Mitra, T. Gregorkiewicz, K. Matsubara, M. Kondo.
Dramatic enhancement of photoluminescence quantum yields for surface-engineered Si nanocrystals within the solar spectrum.
*Advanced Functional Materials***, 23**, 6051 (2013).

35. D. Timmerman, **M.T. Trinh**, W. de Boer, K. Dohnalova, T. Gregorkiewicz.
Manipulating photon energy with Si nanocrystals.
Optics for Solar Energy (OSE), Optical Society of America, ST4A.3 (2012)

36. Y. Gao, E. Talgorn, M. Aerts, **M.T. Trinh**, J. Schins, A. Houtepen, L. Siebbeles
Enhanced hot-carrier cooling and ultrafast spectral diffusion in strongly-coupled PbSe quantum-dot solids.
*Nano Letters***, 11**, 5471 (2011).

37. W. de Boer, **M.T. Trinh**, D. Timmerman, J. Schins, L. Siebbeles, T. Gregorkiewicz.
Increased carrier generation rate in Si nanocrystals in SiO_2 investigated by induced absorption.
*Applied Physics Letters***, 99**, 053126 (2011).

38. N. Ha, S. Cueff, K. Dohnalova, **M.T. Trinh**, C. Labbe, R. Rizk, I. Yassievich, T. Gregorkiewicz.
Photon cutting for excitation of Er^{3+} ions in SiO_2 sensitized by Si quantum dots.
Physical Review B, **84**, 241308(R) (2011).

39. J. Piris, T. Dykstra, A. Bakulin, P. Loosdrecht, W. Knulst, **M.T. Trinh**, J. Schins, L. Siebbeles.
Photogeneration and ultrafast dynamics of excitons and charges in P3HT/PCBM blends.
Journal of Physical Chemistry C, **113**, 14500 (2009).

40. S. Lee, K. Jang. J. Shin, **M.T. Trinh**, K. Lim, I. Sohn, Y. Noh, J. Lee, E. Kim.
Spectral change in silver-doped sodium-borate glass by using femtosecond laser irradiation.
Journal of the Korean Physical Society, **52**, 1665-1668 (2008).

41. **M.T. Trinh**, S. Lee, K. Lim, E. Kim.
Optical memory in DuPont photopolymers by using femtosecond laser pulses.
Journal of the Korean Physical Society, **50**, 474-478 (2007).

42. S. Lee, **M.T. Trinh**, J. Nam, K. Lim, M. Lee.

Laser-induced defect centers and valence state change of Mn ions in sodium borate glasses. *Journal of Luminescence*, **122**, 142-145 (2007).

43. K. Lim, S Lee, **M.T. Trinh**, S. Kim, D. Hamilton, G. Gibson.
Femtosecond laser-induced reduction in Eu-doped sodium borate glasses.
Journal of Luminescence, **122**, 14-16 (2007).
44. **M.T. Trinh**, K. Lim, S. Lee, J. Nam, E. Kim.
Three-dimensional memory using photoreduction of Eu ions.
*Proc. SPIE***, 6327**, 632714-632721 (2006).
45. V. Pham, S. Lee, **M.T. Trinh**, K. Lim, D. Hamilton.
Light-induced absorption and holographic recording in Pr : LiNbO3.
*Journal of the Korean Physical Society***, 49**, 533-537 (2006).
46. V. Pham, S. Lee, **M.T. Trinh**, K. Lim, D. Hamilton, K. Polgár.
Nonvolatile two-color holographic recording in Tm-doped near-stoichiometric $LiNbO_3$.
*Optics Communications***, 248**, 89-96 (2005).
47. K. Lim, V. Pham, S. Lee, **M.T. Trinh**, D. Hamilton, K. Polgar.
Characteristics of two-color holographic recording in Lithium Niobate doped with Thulium.
*Proc. SPIE***, 5560**, 1-8 (2004).
48. K. Lim, V. Pham, S. Lee, **M.T. Trinh**, L. Hesselink, R. Neugaonkar.
Photorefractive and spectroscopic properties of Pr: LiNbO3.
Proc. SPIE, **5206**, 45-54 (2003).

Manuscripts under Review and in Preparation

49. **M.T. Trinh**, K. Makhal, E. Dreyer, A. Shanker, S. Yoon, J. Kim, S. Rand
Direct Evidence of Torque-mediated Optical Magnetism
Physical Review Letters (under review).
50. **M.T. Trinh,** K. Makhal, S. Rand
Highly temporal resolution in cross-beam pump-probe experiment using tilted wavefront
51. J. Guan, K. Tomobe, I. Madu, T. Goodson III, K. Makhal, **M. T. Trinh**, S. Rand, S. Jungsutiwong, R. M. Laine
Synthesis, characterization and photophysical properties of partially functional phenylsilsesquioxanes. *To be submitted to JACS*
52. N. T. Huong, N. N. Son, **M. T. Trinh**, K. Hane, C. M. Hoang
Tunable hybrid gap surface plasmon polariton waveguides with ultralow loss deep-subwavelength propagation. *To be submitted to Laser and Photonics Reviews*
53. **M. T. Trinh**, G. Li, X. Zhong, M. Sfeir, L. Li, M. L. Steigerwald, G. Dong, X.-Y. Zhu.
Many-body Interaction in 0- and 1-dimensional Graphene.

TALKS

Invited

1. Generation of rotations and charge separation with magneto-electric nonlinearities
Seminar at CREOL, University of Central Florida, August 28, 2018, Orlando, FL
2. Generation of rotations in small molecules with magneto-electric nonlinearities.
Foundations of Nonlinear Optics (FoNLO) meeting, June 19-21, 2018, Skidmore, NY.
3. Light-Matter Interaction in Nano-Materials for Optoelectronic Applications.
Physics Seminar, Feb 8, 2018, Viet Nam National University, Ha Noi.
4. Triplet Separation from Triplet Pairs in Intramolecular Singlet Fission.
Singlet Fission Workshop, April 23, 2016, New York University, New York
5. Multiple Exciton Generation in Inorganics Nanocrystal and Organic Molecules.
PChem Seminar, March 1, 2016, Columbia University, New York.

6. Intra-to Inter-Molecular Singlet Fission in Oligoenes.
   Energy Materials Nanotechnology (EMN) Fall Meeting, Nov. 22-25, 2014, Orlando, FL.
7. Intra-to Inter-Molecular Singlet Fission in Diphenyl Dicyano Oligoene.
   Energy Frontier Research Center (EFRC), April 11, 2014, Columbia University, NY.
8. Carrier multiplication in PbSe nanocrystals: towards high efficiency solar cells.
   Department of Chemical Engineering colloquium, October 18, 2010, Delft University of Technology, Delft, the Netherlands.

Conference talks

9. Optical Magnetic Force Induces Molecular Rotations
   CLEO: Laser Science to Photonic Applications, May 14-19, 2018, San Jose, CA.
10. Experimental Observation of Molecular Rotations Stimulated by Optical Magnetic Forces
    American Physical Society (APS) Meeting, March 5-9, 2018, Los Angeles, CA.
11. Free Charge Carriers in Lead Iodide Perovskites Revealed by Transient Absorption Spectroscopy.
    American Physical Society (APS) March Meeting, March 2-6, 2015, San Antonio, TX.
12. Breaking the symmetry of a PbSe quantum dot by a hot electron-hole pair.
    American Physical Society (APS) March Meeting, March 3-7, 2014, Denver, CO.
13. Spatially separated carrier multiplication in silicon Nanocrystals: towards high efficiency solar cells. *The Energy and Materials Research conference (EMR), June 20-22, 2012, Torremolinos, Malaga, Spain. (Chair of the Solar Energy, morning session)*.
14. Direct generation of multiple excitons in adjacent Si nanocrystals upon absorption of a single photon revealed by ultrafast induced absorption. *European Materials Research Society (E-MRS) Spring Meeting, May 14-18, 2012, Strasbourg, France.*
15. Role of hot carriers in carrier multiplication for Si nanocrystals embedded in SiO_2.
    European Materials Research Society (E-MRS) Fall Meeting, Sep 19-23, 2011, Warsaw, Poland.
16. Investigation of microscopic mechanism of space separated quantum cutting in Si nanocrystals embedded in SiO_2-matrix.
    Materials Research Society (MRS) conference, April 25-29, 2011, San Francisco, CA.
17. Effects of an inorganic shell on Carrier Multiplication in PbSe quantum dots
    Joint Solar Programme annual meeting (Foundation for Fundamental Research on Mater: FOM), Jan 12, 2010, University of Amsterdam, Amsterdam, the Netherlands.
18. Ultrafast spectroscopy of optical transitions in PbSe nanocrystals.
    NWO- Theory and Spectroscopy meeting, Feb 15-16, 2010, Veldhoven, the Netherlands.
19. Uncovering the "forbidden" SP transition in PbSe nanocrystals.
    Joint Solar Programme annual meeting (Foundation for Fundamental Research on Mater: FOM), Jan 9, 2009, Delft University of Technology, Delft, the Netherlands.
20. Generation of multiple excitons by a single photon: towards high efficiency solar cells.
    NWO-Theory and Spectroscopy meeting, Jan 26-27, 2009, Lunteren, the Netherlands.
21. Multi-Exciton Generation in PbSe Nanocrystals.
    Joint Solar Programme annual meeting (Foundation for Fundamental Research on Mater: FOM), Dec 20, 2007. University of Groningen, the Netherlands.
22. Multi-exciton generation and dissociation in PbSe/P3HT blend for high-efficiency solar cells.
    Joint Solar Programme annual meeting (Foundation for Fundamental Research on Mater: FOM), Jan 11, 2007. Utrecht University, the Netherlands.

TECHNICAL SKILLS

- Construction of complicated optical setups from scratch and designing experiments. Repair and maintenance of ultrafast laser systems.

- Ultrafast spectroscopies: transient absorption, time-resolved second harmonic generation, optical pump-THz probe, optical Kerr effect.
- Standard spectroscopies, time-resolved photoluminescence, relative and absolute photoluminescence quantum yield measurements, Fourier Transform infrared spectroscopy (FT-IR), Raman spectroscopy, experiments in cryogenic temperature (liquid N_2 and helium).
- Data analysis/simulations and data acquisitions with programs: Igor, Origin, Matlab, Mathematica, and LabView.
- Sample preparation: Organic and perovskite thin films by molecular thermal evaporation under high vacuum, grew single perovskite crystals, grew Si nanocrystal by radio-frequency co-sputtering and post high temperature annealing, synthesis PbSe/PbS nanocrystals by hot chemical injection method, grew rare-earth doped glasses. Sample characterization using AFM and XRD. Ultrahigh vacuum experience. Clean room experience.
- Organic solar cell and photodetector fabrications and characterizations.

REFERENCES

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