

## Mei Chee TAN

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### RESEARCH INTERESTS

- Synthesis and modification of nanomaterials using solution-based processing methods
- Tailoring interfacial properties of nanomaterials and composites
- Control material properties using tailored advanced (micro)structures
- Develop structure-property relationships for multiscale composite systems

### EDUCATION

- April 02 – Nov 06 **Singapore-MIT Alliance, Singapore**  
**Ph.D. in Molecular Engineering of Biological and Chemical Systems**
- July 01 – June 03 **Singapore-MIT Alliance, Singapore**  
**M.Sc. in Molecular Engineering of Biological and Chemical Systems**
- July 97 – July 01 **National University of Singapore, Singapore**  
**B.Eng. (Chemical Engineering), Second Class Honors (Upper)**

### EXPERIENCE

- Dec 2018 – present **Associate Professor**  
**Engineering Product Development**  
**Singapore University of Technology and Design, Singapore**
- Sept 11 – Nov 2018 **Assistant Professor**  
**Engineering Product Development**  
**Singapore University of Technology and Design, Singapore**
- Aug 07 – Aug 11 **Postdoctoral Associate**  
**Department of Materials Science and Engineering,**  
**Rutgers, The State University of New Jersey, Piscataway, NJ, USA**
- July 05 – June 06 **Research Fellow**  
**Department of Materials Science and Engineering,**  
**National University of Singapore, Singapore**

### TEACHING EXPERIENCE

- Jan 19 – Mar 19 10.011 Introduction to Physical Chemistry
- Sept 18 – Dec 18 30.108 Introduction to Materials Science
- Jan 18 – Mar 18 10.011 Introduction to Physical Chemistry
- Sept 17 – Dec 17 30.108 Introduction to Materials Science
- Jan 17 – Mar 17 10.011 Introduction to Physical Chemistry
- Sept 16 – Dec 16 30.108 Introduction to Materials Science
- May 16 – Aug 16 10.006 Chemistry and Biology: The Natural World
- Jan 16 – Mar 16 10.011 Introduction to Physical Chemistry
- Sept 15 – Dec 15 30.108 Introduction to Materials Science
- May 15 – Aug 15 10.006 Chemistry and Biology: The Natural World
- Sept 14 – Dec 14 30.108 Introduction to Materials Science
- May 12 – Feb 15 10.003 Chemistry; also the course lead for a team of ~10 instructors
- Sept 13 – Dec 13 30.590 Research Seminar I
- Jan 12 – April 12 Chemistry Integrated Learning Program

- Sept 08 – Dec 08      **Lecturer**  
 Oct 07 – Nov 07      **Department of Materials Science and Engineering**  
**Rutgers, The State University of New Jersey, Piscataway, NJ, USA**  
 • Materials Microprocessing (undergraduate)
- July 06 – June 07      **Teaching Assistant**  
**Department of Materials Science and Engineering**  
**National University of Singapore, Singapore**  
 • Introductory Materials Science and Engineering (undergraduate)  
 • Physical Properties of Materials; Nanomaterials: Science and Engineering (graduate)
- Aug 05                      **Graduate Teaching Assistant**  
 July 04 – Aug 04      **Molecular Engineering of Biological and Chemical Systems,**  
 July 02 – Aug 02      **Singapore-MIT Alliance, Singapore**  
 • Molecular Aspects of Materials Design (graduate)  
 • Molecular and Cellular Aspects of Biotechnology (graduate)

## **PROFESSIONAL MEMBERSHIP AND SERVICES**

- **Member & Deputy Chair, Institution Review Board, SUTD** (2012 – 2018)
- **Member, Admissions Committee for Engineering Product Development PhD Program, SUTD** (2012 – 2017)
- **Member, Committee for Research Space Design, SUTD** (2012 – 2014)
- **Students mentored:** 3 PhD graduate and 8 undergraduate students
- **Current research assistant:** Daniel Wirawan
- **Current postdoctoral researchers:** JINGKUK Kim, Zhao Xinyu, Yu Qi
- **Group Alumni:**
  - Postdoctoral Research Fellow, Wu Yingsi (currently at [yingsiwucc@gmail.com](mailto:yingsiwucc@gmail.com) NTU-ISR,)
  - Postdoctoral Research Fellow, Zhang Yuanyuan (currently at [zyy19861121@126.com](mailto:zyy19861121@126.com), Shenzheng University)
  - Postdoctoral Research Fellow, He Shuqing (currently at [heshuqing09@szu.edu.cn](mailto:heshuqing09@szu.edu.cn) Shenzhen University)
  - Postdoctoral Research Fellow, Sheng Yang (currently at [shengyang@cczu.edu.cn](mailto:shengyang@cczu.edu.cn); Materials Science and Engineering, Changzhou University, China),
  - SUTD-MIT Postdoctoral Research Fellow, Shafigh Mehraeen (currently at [shafigh.mehraeen@gmail.com](mailto:shafigh.mehraeen@gmail.com), Chemical Engineering, University of Illinois at Chicago)
  - Undergraduate students: Lee Jun Xiang (currently with ZaiBike), Jermaine Cheng Zhimin (currently with Apple)
- **Society Membership:** American Chemical Society; Materials Research Society; International Solvothermal and Hydrothermal Association
- **Member of Editorial Advisory Board:** Nature Scientific Reports
- **Symposium Chair:**
  - Chair for “Novel Solution Processes for Advanced Functional Materials” during International Conference on Materials for Advanced Technologies, 2015 and 2017.

- **Reviewer Services for PhD Thesis and Research Proposals:**
  - Technology Foundation STW (VIDI Programme; Innovational Research Incentive Scheme 2015, Netherlands Organisation for Scientific Research)
  - Cooperation in Science and Technology (COST) Research Proposal Switzerland at the State Secretariat for Education, Research and Innovation (SERI)
  - PhD Thesis Examiner for NUS
- **Reviewer Services for Journals:** ACS Nano, Nanoscale Horizon, Advanced Optical Materials, Advanced Functional Materials, Acta Biomaterialia, Advanced Functional Materials, Advanced Materials, Scientific Reports Journal of Luminescence, Catalysis Communication, Nanomedicine, RSC Nanoscale, ChemNanoMat, Journal of Colloid and Interface, Medical & Biological Engineering & Computing, Australian Journal of Chemistry, Journal of Crystal Growth, Journal of Materials Science: Materials in Medicine, Optical Material Express, Applied Physics B, Inorganic Chemistry, Nanotechnology, Journal of Physical Chemistry, Journal of Nanoscience and Nanotechnology, ACS Applied Materials and Interfaces

## JOURNAL PUBLICATIONS

- X Zhao, L Song, R Zhao, **MC Tan**, High-Performance and Flexible Shortwave Infrared Photodetectors Using Composites of Rare Earth-Doped Nanoparticles. [ACS Applied Materials & Interfaces](#) 11:2344 (2019).
- Z Zhao, H Kantamneni, S He, S Pelka, AS Venkataraman, M Kwon, SK Libutti, M Pierce, PV Moghe, V Ganapathy, **MC Tan**, Surface-Modified Shortwave-Infrared-Emitting Nanophotonic Reporters for Gene-Therapy Applications. [ACS Biomaterials Science & Engineering](#) 4:2350 (2018).
- Y Wu, Z Wang, X Zhao, **MC Tan**, Size and surface effects on chemically-induced joining of Ag conductive inks. [CrystEngComm](#) 20:6300 (2018).
- S Hu, Q Wu, X Wu, J Li, H Cao, S Zhan, Y Liu, **MC Tan**, Simultaneous luminescence and magnetic control of NaLuF<sub>4</sub>: Yb<sup>3+</sup>/Er<sup>3+</sup> by introducing NaMnF<sub>3</sub> and the application for detecting basic fuchsin. [Journal of Alloys and Compounds](#), 745:490 (2018).
- LM Higgins, V Ganapathy, H Kantamneni, XY Zhao, Y. Sheng, **MC Tan**, CM Roth, RE Riman, PV Moghe, MC Pierce, Multiscale optical imaging of rare-earth-doped nanocomposites in a small animal model. [Journal of Biomedical Optics](#) 23:030505 (2018).
- Y Zhang, MC Tan, “Programmable light-activated gradient materials based on graphene-polymer composites,” [Advanced Material Interfaces](#), 5:1701374 (2018).
- H Kantamneni, M Zevon, X Zhao, Y Sheng, LM Higgins, W Banach-Petrosky, S Ganesan, RE Riman, CM Roth, **MC Tan**, V Ganapathy, M Pierce, PV Moghe, “Engineering Precision Surveillance Nanotechnology for Multi-Organ Cancer Metastases In-Vivo,” [Nature Biomedical Engineering](#), 1:993 (2017).
- S He, X Zhao, **MC Tan**, “Synthesis of Uniform Rare Earth Doped Gd<sub>2</sub>O<sub>3</sub> Sub-micron Sized Spheres Using Gas-Aided Sulfurization and its Optical Characteristics,” [RSC Advances](#), 7:35738 (2017).
- Y Wu, L-D Liao, H-C Pan, L He, C-T Lin, **MC Tan**, “Fabrication and Interfacial Characteristics of Surface Modified Ag Nanoparticle Based Conductive Composites,” [RSC Advances](#), 7:29702 (2017).

- P Xing, GFR Chen, X Zhao, DKT Ng, **MC Tan**, DTH Tan, “Silicon Rich Nitride Ring Resonators for rare – earth doped C-band amplifiers pumped at the O-band,” [Scientific Reports](#), 7:9101 (2017).
- GFR Chen, X Zhao, Y Sun, C He, **MC Tan**,\* DTH Tan,\* “Low-Loss Nanostructured On-Chip Channel Polymeric Waveguide Amplifier,” [Scientific Reports](#), 7:3366 (2017). \*co-corresponding author
- X Zhao, S He, **MC Tan**, “Advancements in Infrared Imaging Platforms: Complementary Imaging Systems and Contrast Agents,” [Journal of Materials Chemistry B](#), *invited submission for Emerging Investigator Series* (2017).
- X Zhao, Y Sheng, L-D Liao, N Thakor, **MC Tan**, “Rare-Earth Doped CaF<sub>2</sub> Nanocrystals for Dual-Modal Short-Wavelength Infrared Fluorescence And Photoacoustic Imaging”, [Nanoscience and Nanotechnology Letters](#), 9:481 (2017).
- Y Sheng, JX Lee, JZM Cheng, **MC Tan**, “Facile Synthesis of Monodisperse Nanostructured Silver Micro-Colloids via Controlled Agglomeration and Coalescence,” [Journal of Nanoscience and Nanotechnology](#), 17:626 (2017).
- Y Sheng, L-De Liao, A Bandla, Y-H Liu, J Yuan, N Thakor, **MC Tan**, “Enhanced Near-Infrared Photoacoustic Imaging of Silica-Coated Rare-Earth Doped Nanoparticles”, [Materials Science and Engineering: C](#) 70, Part 1: 340 (2017).
- X Zhao, S He, **MC Tan**, “Design of Infrared-Emitting Rare Earth Doped Nanoparticles and Nanostructured Composites,” [Journal of Materials Chemistry C](#), Invited Review, 4: 8349 (2016).
- X Zhao, Y Sun, C He, **MC Tan**, “Synthesis and Interfacial Properties of Optically-Active Photonic Nanocomposites with Single Nanoparticle Dispersion at High Solids Loading”, [Advanced Material Interfaces](#), 3:1600334 (2016).
- Y Sheng, L-De Liao, A Bandla, Y-H Liu, N Thakor, **MC Tan**, “Size and Shell Effects on the Photoacoustic and Luminescence Properties of Dual Modal Rare-Earth-Doped Nanoparticles for Infrared Photoacoustic Imaging”, [ACS Biomaterials Science and Engineering](#), 2:809 (2016).
- X Zhao, **MC Tan**, “Tailoring SWIR Emission in Tri-Lanthanide-Doped CaF<sub>2</sub> Nanoparticles”, [RSC Advances](#), 6:18348 (2016).
- M Zevon, V Ganapathy, H Kantamneni, M Mingozi, P Kim, D Adler, Y Sheng, **MC Tan**, M Pierce, RE Riman, CM Roth, PV Moghe, “CXCR-4 Targeted, Short Wave Infrared (SWIR) Emitting Nanoprobes for Enhanced Deep Tissue Imaging and Micrometastatic Cancer Lesion Detection,” [Small](#), 11: 6347 (2015).
- Y Tong, X Zhao, **MC Tan**, R Zhao, “Cost-effective and Highly Photoresponsive Nanophosphor-P3HT Photoconductive Nanocomposite for Near-infrared Detection,” [Scientific Reports](#), 5:16761 (2015). \*co-corresponding author
- X Zhao, **MC Tan**, “Ce Dopant Effects on NaYF<sub>4</sub> Particle Morphology and Optical Properties,” [Journal of Materials Chemistry C](#), 3: 10207 (2015).
- LM Higgins, M Zevon, V Ganapathy, Y Sheng, **MC Tan**, RE Riman, CM Roth, PV Moghe, MC Pierce “Line-scanning Confocal Microscopy for High-resolution Imaging of Rare-earth-based Upconverting Contrast Agents,” [Journal of Biomedical Optics](#), 20: 110506 (2015).
- B Wang, L Axe, Z-H Michalopoulou, RE Riman, **MC Tan**, L Wei, “Light absorption properties of the new york/new jersey harbor estuary,” [Hydrobiologia](#), Sept:1-16 (2015).
- S Mehraeen, M Asbahi, F Wang, JKW Yang, J Cao, **MC Tan**, “Directed Self-assembly of sub-10 nm Particles: Role of Driving Forces and Template Geometry in Packing and Ordering,” [Langmuir](#), 31:8548 (2015).

- M Asbahi, S Mehraeen, F Wang, N Yakovlev, KSL Chong, J Cao, **MC Tan**, JKW Yang "Large Area Directed Self-Assembly of Sub-10 nm Particles with Single Particle Positioning Resolution," Nano Letters, 15:6066 (2015).
- Y Sheng, L-D Liao, N Thakor, **MC Tan**, "Rare-Earth Doped Particles as Dual-Modality Contrast Agent for Minimally-Invasive Luminescence and Dual-Wavelength Photoacoustic Imaging," Scientific Reports., 4:6562 (2014).
- M Asbahi, S Mehraeen, KTP Lim, F Wang, J Cao, **MC Tan**, JKW Yang, "Template-induced structure transition in sub-10-nm self-assembling nanoparticles", Nano Letters, 10:2642 (2014).
- DJ Naczynski, **MC Tan**, RE Riman, PV Moghe, "Rare Earth Nanoprobes for Functional Biomolecular Imaging and Theranostics", Feature Article, Journal of Materials Chemistry B, 2:2958 (2014).
- Y Sheng, LD Liao, N Thakor, **MC Tan**, "Nanoparticles for Molecular Imaging", Journal of Biomedical Nanotechnology, 10:2641 (2014).
- **MC Tan**, DJ Naczynski, PV Moghe, RE Riman, "Engineering the Design of Brightly-Emitting Luminescent Nanostructured Photonic Composite Systems", Australian Journal of Chemistry, 66:1008 (2013).
- DJ Naczynski, **MC Tan**, M Zevon, B Wall, J Kohl, A Kulesa, S Chen, CM Roth, RE Riman, PV Moghe, "Rare-Earth-Doped Biological Composites as In Vivo Shortwave Infrared Reporters", Nature Communications 4:2199 (2013).
- D Yuan, **MC Tan**, RE Riman, GM Chow, "A Comprehensive Study on the Size Effects of the Optical Properties of NaYF<sub>4</sub>:Yb,Er nanocrystals", Journal of Physical Chemistry C, 117:13297 (2013).
- B van Saders, L Baroudi, **MC Tan**, RE Riman, "Rare-earth doped particles with tunable infrared emissions for biomedical imaging", Optical Materials Express, 3:566 (2013).
- **MC Tan**, L Baroudi, RE Riman, "Surfactant Effects on Efficiency Enhancement of Infrared-to-Visible Upconversion Emissions of NaYF<sub>4</sub>:Yb-Er", ACS Applied Materials and Interfaces, 3:3910 (2011).
- A Kornienko, BF Moore, GA Kumar, **MC Tan**, RE Riman, MG. Brik, TJ Emge, JG Brennan, "Highly NIR-Emissive Lanthanide Polyselenides", Inorganic Chemistry, 50:9184 (2011).
- **MC Tan**, J Connolly, RE Riman, "Optical Efficiency of Short Wave Infrared Emitting Phosphors", Journal of Physical Chemistry C, 115:17952 (2011).
- M Christina, **MC Tan**, M Starr, AE Payzant, J Howe, Jane, RE Riman, "Size-Dependent Crystalline to Amorphous Uphill Phase Transformation of Hydroxyapatite Nanoparticles." Crystal Growth & Design, 11:45 (2011).
- BF Moore, A Kumar, **MC Tan**, J Kohl, RE Riman, MG Brik, TJ Emge, JG Brennan, "Lanthanide Clusters with Chalcogen Encapsulated Ln: NIR Emission from Nanoscale NdSe<sub>x</sub>", Journal of American Chemical Society, 133:373 (2011).
- **MC Tan**, SD Patil, RE Riman, "Transparent infrared-emitting CeF<sub>3</sub>:Yb-Er polymer nanocomposites for optical applications", ACS Applied Materials and Interfaces, 2:1884 (2010).
- T Andelman, **MC Tan**, RE Riman, "Thermochemical engineering of hydrothermal crystallization processes", Materials Research Innovations, 14:9 (2010).
- Q Wang, **MC Tan**, R Zhuo, GA Kumar, RE Riman, "A solvothermal route to size-controlled highly luminescent NaYF<sub>4</sub>:Yb,Er upconversion nanocrystals", Journal of Nanoscience and Nanotechnology, 10:1685 (2010).
- **MC Tan**, GA Kumar, RE Riman, "Near infrared-emitting Er- and Yb-Er doped CeF<sub>3</sub> nanoparticles with no visible upconversion", Optics Express, 17:15904 (2009).

- **MC Tan**, GA Kumar, RE Riman, MG Brik, E Brown, U Hommerich “Synthesis and optical properties of infrared emitting YF<sub>3</sub>:Nd nanoparticles”, Journal of Applied Physics, 106:063118 (2009).
- **MC Tan**, JY Ying, GM Chow, “Interfacial properties and *in vitro* cytotoxic effects of surface-modified near infrared absorbing Au-Au<sub>2</sub>S nanoparticles”, Journal of Materials Science: Materials in Medicine, 20:2091 (2009).
- XL Huang, B Zhang, L Ren, SF Ye, LP Sun, QQ Zhang, **MC Tan**, GM Chow, “*In vivo* toxic studies and biodistribution of near infrared sensitive Au-Au<sub>2</sub>S nanoparticles as potential drug delivery carriers”, Journal of Materials Science: Materials in Medicine, 19:2581 (2008).
- L Ren, XL Huang, B Zhang, LP Sun, QQ Zhang, **MC Tan**, GM Chow, “Cisplatin loaded Au-Au<sub>2</sub>S nanoparticles for potential cancer therapy: Cytotoxicity, *in vitro* carcinogenicity, and cellular uptake”, Journal of Biomedical Materials Research: Part A, 85A:787 (2008).
- **MC Tan**, JY Ying, GM Chow, “Composition, particle size and near infrared irradiation effects on optical properties of Au-Au<sub>2</sub>S nanoparticles”, Journal of Materials Research, 23:281 (2008).
- **MC Tan**, JY Ying, GM Chow, “Structure and microstructure of near infrared-absorbing Au-Au<sub>2</sub>S nanoparticles”, Journal of Materials Research, 22:2531 (2007).
- B Zhang; XL Huang; L Ren; QQ Zhang, **MC Tan**, GM Chow, “Biocompatibility of Near-IR sensitive Au-based nanoparticles as the potential drug delivery carriers”, Key Engineering Materials, 334-335:1177 (2007).
- SR Fox, HK Tan, **MC Tan**, SC Niki C Wong, Miranda GS Yap, Daniel IC Wang, Detailed understanding of the enhanced hypothermic productivity of interferon-g by Chinese hamster ovary cells, Biotechnology and Applied Biochemistry, 41:255 (2005).

#### BOOK & BOOK CHAPTER

- Y Sheng, **MC Tan**, “Designing Inorganic Nanoparticles for Biomedical Imaging” in Encyclopedia of Nanoscience and Nanotechnology edited by Dr. Hari Singh Nalwa, accepted, 2016.
- **MC Tan**, GM Chow, L Ren, “Nanostructured Materials for Biomedical Applications”, Transworld Research Network, 978-81-7895-397-7, 2009.
- **MC Tan**, GM Chow, L Ren, QQ Zhang, “Inorganic Nanoparticles for Biomedical Applications” in NanoScience in Biomedicine edited by D. Shi (Springer and Tsinghua University Press, ISBN: 978-3-540-49660-1, 2008).

#### PENDING PATENTS

- HY Low, MC Tan, J Kim, D Wirawan, HC Wong, A product construct with controlled adsorption kinetics for passive carbon capture, Disclosure Filed (2018).
- MC Tan, HY Low, HC Wong, Y Zhang, Membrane Integrated Products, Singapore Provisional Patent Application No. 10201601629S (2016).
- Y Sun; X Zhao, C He, **MC Tan**, Fabricating Composites With Single Particle Dispersion At High Solids Loading, Disclosure Filed (2015).
- Y Tong, X Zhao, R Zhao, **MC Tan**, Fabrication Process of Ultra-high Efficiency, Flexible and Cost Effective Photoconductor, Singapore Provisional Patent 10201508815V (2015).
- **MC Tan**, Richard E. Riman, Surfactant effects on efficiency enhancement of light emitting particles, Disclosure filed (2011)

- Richard E. Riman, **MC Tan**, GA Kumar, Near Infrared-Emitting Er and Yb/Er Doped CeF<sub>3</sub> Nanoparticulates with No Visible Upconversion, US Patent 20,130,032,759 A1 (2013).
- DJ Naczynski, **MC Tan**, CM Roth, RE Riman, PV Moghe, Multifunctional infrared-emitting composites, PCT Patent WO2012151593A1 (2012).
- **MC Tan**, RE Riman, Surfactant Effects on Efficiency Enhancement of Infrared-to-Visible Upconversion Emissions of NaYF<sub>4</sub>:Yb-Er, US Provisional Patent, Application Number 70439.00580 (2011).
- **MC Tan**, RE Riman, Upconversion phosphors for mapping of circulatory and ductal pathways, Disclosure filed (2010).
- **MC Tan**, RE Riman, IR-activated photoelectric systems, PCT Patent WO 2012082118 (2012).
- RE. Riman, **MC Tan**, GA Kumar, Near Infrared-Emitting Er and Yb/Er Doped CeF<sub>3</sub> Nanoparticles with No Visible Upconversion, *US patent application pending*, Application Number 13/466,079 (2012).
- GM Chow, **MC Tan**, L Ren, JY Ying, NIR-sensitive nanoparticle, Publication Number 2006099146 (2006).

## ORAL PRESENTATIONS

- **MC Tan**, Y Wu, Z Wang, X Zhao, Controlling Dispersion Characteristics of Ag-PDMS Conductive Composites, Solid Freeform Fabrication Symposium: An Additive Manufacturing Conference, Austin, Texas, United States, August 14, 2018.
- **MC Tan**, X Zhao, Z Zhao, Infrared Emitting Polymeric Composites as Photonic Probes and Devices, 6th International Solvothermal and Hydrothermal Association Conference (ISHA2018), Sendai Japan, August 9, 2018 (*invited talk*).
- **MC Tan**, X Zhao, Y Sun, G Chen, C He, D Tan, Efficient Infrared Emitting Polymeric Composites for Photonic Devices and Waveguides, TH1.8 Energy, Optics, and Optoelectronics, IUPAC MACRO Cairns Australia, July 5 2018.
- **MC Tan**, Infrared Emitting Polymeric Composites as Photonic Probes and Devices, 3rd International Conference on Microstructure and Property of Materials, Zhejiang University, May 27, 2018 (*invited talk*).
- **MC Tan**, Y Zhang, J Kim, D Wirawan, HC Wong, HY Low, Mixed Matrix Composites based on PEI-Silica Sorbents for Direct Indoor CO<sub>2</sub> Capture, EN04: Advanced Materials for Carbon Capture and Other Important Gas Separations, MRS Spring Meeting, Phoenix Arizona, April 5, 2018.
- **MC Tan**, Y Wu, X Zhao, Controlling Surface and Dispersion Characteristics of Ag Particle Based Inks to Improve Electrical and Sensing Properties of Conductive Composites, MA01: Advanced Materials for Analog and Digital Functional Printing, MRS Spring Meeting, Phoenix Arizona, April 3, 2018.
- **MC Tan**, Z Zhao, X Zhao, Y Sheng, A Bandla, J Yuan, L-D Liao, N Thakor, Rare Earth Doped Nanoparticles as Dual-Modality Contrast Agents, NanoNeuroPhotonics Symposium 2018; National University of Singapore, March 14, 2018.
- **MC Tan**, S He, X Zhao, Y Sheng, L-D Liao, NV Thakor, Rare Earth Doped Nanoparticles as Dual-Modality Contrast Agents, International Symposium on Imaging Frontier, July 8-9, 2017 (*invited talk*).
- Y Wu, **MC Tan**, Fabrication and Interfacial Characteristics of Conductive Composites using Surface-Modified Ag Particles, International Conference on Materials for Advanced Technologies, Singapore, June 2017.

- X Zhao, Y Sun, GFR Chen, DTH Tan, C He, **MC Tan**, Tailoring Rare-Earth Doped Nanoparticle Dispersion for Polymer Based Waveguide Amplifier, International Conference on Materials for Advanced Technologies, Singapore, June 2017.
- X Zhao, Y Sun, C He, **MC Tan**, Designing and Creating Low-Loss Infrared-Emitting Nanostructured Active Photonic Composites, Trends in Nanotechnology International Conference (TNT2016), Materials for Energy Applications, Fribourg, Switzerland, September 5-9, 2016.
- X Zhao, Y Sun, C He, **MC Tan**, Tailoring Inorganic Nanoparticle Dispersion For Infrared-Emitting Low-Loss Nanostructured Active Photonic Composites, 8th International Conference on Technological Advances of Thin Films and Surface Coatings, Symposium: Nanostructured and Nanocomposite Films and Coatings (NNF), Singapore July 15, 2016
- LLA Koh, PD Christie, **MC Tan**, G-Y Pee, A Bagiati, JG Brisson, Implementation of flipped classroom methods to build up a student's Chemistry background, International Symposium on Fundamental and Applied Sciences, Kyoto, Japan, March 29 to 31, 2016.
- Y Tong, X Zhao, **MC Tan**, R Zhao, Design and Engineering of Highly Sensitive and Flexible Near-Infrared Photoconductors Using Upconverting Nanocomposites, MRS Spring, Phoenix, Arizona, March 2016.
- LM Higgins, M Zevon, V Ganapathy, H Kantamne, Y Sheng, **MC Tan**, RE Riman, CM Roth, PV Moghe, MC Pierce, High-Resolution Imaging of Molecularly Targeted Rare-Earth Based Nanocomposites, Biomedical Optics Congress 2016 (Brain, Cancer, OTS, Translational), Optical Society of America, Fort Lauderdale, Florida.
- **MC Tan**, Y Sheng, X Zhao, L-D Liao, N Thakor, Solvothermal Synthesis of Infrared-Emitting Rare Earth Doped Nanocomposites For Applications in Optical Devices and Biomedical Imaging, 2nd International Symposium on Nanoparticles/Nanomaterials and Applications, Lisbon, Portugal, January 18-21, 2016 (*invited talk*).
- M Zevon, V Ganapathy, H Kantamneni, **MC Tan**, L Higgins, X Zhao, Y Sheng, M Pierce, RE Riman, C Roth, P Moghe, Rare-Earth Albumin Nanocomposites For Improved Deep Tissue In Vivo Optical Imaging And Micrometastatic Lesion Detection, Biomedical Engineering Society (BMES) Annual Meeting, Tampa, USA, October 7-10, 2015.
- **MC Tan**, X Zhao, Y Sheng, Solvothermal synthesis of ceramic-polymer luminescent nanocomposites for optical applications, Molecular Materials Meeting (M3) @ Singapore, August 2015 (*invited talk*).
- PD Christie, **MC Tan**, G-Y Pee, LLA Koh, A Bagiati, JG Brisson, Using On-Line Videos to Teach Concepts in Chemistry, International Scientific Conference on Engineering and Applied Sciences, Okinawa, Japan, July 29-31 2015.
- X Zhao, **MC Tan**, Erbium-Doped Nanoparticles for Low-Loss Nanostructured Photonic Composites, International Conference on Materials for Advanced Technologies, Singapore, July 2015.
- Y Sheng, L-D Liao, NV Thakor, **MC Tan**, Rare-Earth Doped Particles as Dual-Modality Contrast Agents, International Conference on Materials for Advanced Technologies, Singapore, July 2015.
- Martin Dunn, **MC Tan**, "3D Multimaterial Printing for Teaching Composite Materials", Asian Materials Education, Singapore, December 12 2014.
- Y Sheng, L-D Liao, N Thakor, **MC Tan**, Rare-Earth Doped Particles for Minimally-Invasive Dual-Modal Bio-Imaging, MRS Fall Meeting, Symposium D14.05, Boston, USA, December 3, 2014.

- **MC Tan**, Richard E Riman, Design and Synthesis of Nanostructured Optical Composites, 4th International Solvothermal and Hydrothermal Association Conference – ISHA 2014, October 2014, Bordeaux, France (*invited talk*).
- M Zevon, V Ganapathy, P Kim, D Naczynski, **MC Tan**, R Riman, C Roth, P Moghe, Design of Biofunctionalized Rare-Earth Albumin Nanocomposites for Tumor Microlesion Detection and Tracking, BMES 2014 Annual Meeting: Cancer Technologies, Biomedical Imaging and Optics - Imaging Strategies in Cancer, San Antonio, United States, October 24, 2014.
- **MC Tan**, Engineering the Design of Brightly-Emitting Luminescent Nanostructured Photonic Composite Systems, 15<sup>th</sup> Asian Chemical Congress, Singapore, August 2013 (*invited talk*).
- **MC Tan**, Synthesis and Characterization of Rare-earth Doped Particles with Tunable Infrared Emissions for Biomedical Applications, International Conference on Materials for Advanced Technologies, Singapore, July 2013.
- **MC Tan**, Richard E. Riman, Solvothermal Synthesis Of Optical Ceramic-Polymer Nanocomposites, 3rd Molecular Materials Meeting (M3) @ Singapore, January 2013 (*invited talk*).
- **MC Tan**, Optical Ceramic-Polymer Nanocomposites for Biomedical Applications, 3rd ISESCO International Workshop and Conference on Nanotechnology: Nanomaterials for Green Technology, Selangor, Malaysia, December 2012 (*invited talk*).
- DJ Naczynska, **MC Tan**, M Zevon, B Wall, J Kohl, T Kulesa, C Roth, S Chen, R Riman, P Moghe, Infrared-Emitting, Multifunctional Rare-Earth Doped Nanoparticles in Encapsulated Albumin Nanocarriers for Targeted Tissue Imaging, 9<sup>th</sup> World Biomaterials Congress, Chengdu, China, June 2012.
- **MC Tan**, RE Riman, Solvothermal Synthesis of Optical Ceramic-Polymer Nanocomposites, International Conference on Luminescence and its Applications, Hyderabad, India, February 2012 (*invited talk*).
- RE Riman, **MC Tan**, GA Kumar, DJ Naczynski, CM Roth, PV Moghe, Solvothermal Synthesis of Optical Ceramic-Polymer Nanocomposites, Telluride Summer Research Center Workshop, Telluride, Colorado, July 2011.
- M Romanelli, K Norton, B Moore, **MC Tan**, A Kumar, TJ Emge, RE Riman, JG Brennan, NIR Emission From Nanoscale Lanthanide Fluoride, Oxide, And Chalcogenide Clusters, 26th Rare Earth Research Conference, New Mexico, June 2011.
- DJ. Naczynski, **MC Tan**, T Andelman, RE Riman, CM. Roth, PV Moghe, Multifunctional Rare-Earth Doped Nanoparticles in Encapsulated Albumin Nanocarriers for Tumor Targeting, E-MRS Symposium O: Bio-nanomaterials for imaging, sensing and actuating, Nice, France May 2011.
- RE Riman, **MC Tan**, GA Kumar, SD Patil, L Baroudi, T Andelman, D Naczynski, P Moghe, “Biomedical Phosphors: What are they and how do they work?”, J&J Focused Funding Symposium, New Jersey, USA, November 2009.
- RE Riman, **MC Tan**, GA Kumar, S Patil, HJ Kim, “Low temperature solution synthesis of optical ceramic-polymer nanocomposite materials”, 7<sup>th</sup> Composites at Lake Louise Conference, Canada 2009.
- HJ Kim, **MC Tan**, GA Kumar, RE Riman, “Engineered active particulate monolayer materials for optical applications”, Materials Science and Technology, Pittsburgh, Pennsylvania, USA, October 2009.
- **MC Tan**, GA Kumar, RE Riman, “Engineering ceramic nanophosphors for optical applications”, Engineering Conference International, Colorado Springs, Colorado, USA, June 2009 (*invited talk*).

- **MC Tan**, GA Kumar, RE Riman, “Near infrared-emitting rare earth doped CeF<sub>3</sub> nanoparticles”, International Conference on Materials for Advanced Technologies, Singapore, June 2009.

## POSTER PRESENTATIONS

- G Dixon, **MC Tan**, Materials Driven Innovations: Two case study perspectives, 3rd Asian Materials Education Symposium, December 13-14, 2018. **1<sup>st</sup> Prize Poster Award**
- X Zhao, L Song, R Zhao, **MC Tan**, High-Performance and Flexible Shortwave Infrared Photodetectors Using Composites of Rare Earth Doped Nanoparticles, Advanced Materials AM30 Symposium Singapore, December 4 2018.
- J Kim, D Wirawan, HC Wong, HY Low, **MC Tan**, CO<sub>2</sub> Adsorptive Mixed Matrix Membranes for CO<sub>2</sub> Capture from Ambient Air, Euromembrane 2018, Valencia, 9th - 13th July 2018.
- X Zhao, Y Sun, GFR Chen, DTH Tan, C He, **MC Tan**, “Infrared-emitting low-loss nanostructured photonic polymeric composite waveguides”, Seville, Spain, Frontiers in Polymer Science, Thursday 18 May, 2017.
- S He, Y Sheng, L-D Liao, N V. Thakor and **MC Tan**, “Rare Earth doped nanocomposites as dual modal contrast agents for infrared fluorescence and photoacoustic imaging”, Fifth International Conference on Multifunctional, Hybrid and Nanomaterials, Lisbon, Portugal March 6 to 10, 2017
- A Silva, **MC Tan**, JCS Teo, SC Lim, Amplifying Discovery: Teaching of Engineering Materials with Sample Materials, 2nd Asian Materials Education Symposium, Dec 8-9, 2016.
- S He, L-D Liao, NV Thakor, **MC Tan**, PEI-Coated Rare Earth Doped Nanoparticles as Dual-Modality Contrast Agent for Shortwave Infrared and Photoacoustic Imaging, Molecular Probes, Biomedical Imaging and Optics, 2016 Biomedical Engineering Society (BMES) Annual Meeting, Minneapolis Convention Center/ Minneapolis, Minnesota, Oct 5 to Oct 8, 2016.
- S He, J Yuan, L-D Liao, NV Thakor, **MC Tan**, Rare earth nanoparticles@PLGA microsphere as multiscale contrast agent probe for shortwave infrared and photoacoustic imaging, 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society of the IEEE Engineering in Medicine and Biology Society (EMBC'16), August 16-20, 2016.
- X Zhao, L-D Liao, N Thakor, **MC Tan**, Enhanced SWIR-Emitting CaF<sub>2</sub> nanoparticles as Dual-Modality Contrast Agent for IR Luminescence and Photoacoustic Imaging, EMRS Spring, Symposium R, 2016.
- K Lim, M Asbahi, S Mehraeen, F Wang, J Cao, **MC Tan**, Joel Yang, Directed self-assembly of nanoparticles: Template control of nanostructure configurations, Fundamental Research in Colloids, Surfaces & Nanomaterials Symposia, 2015.
- S Mehraeen, M Asbahi, W Fuke, J Yang, J Cao, **MC Tan**, Directed Self-Assembly of Sub-10 nm Particles: Role of Driving Forces and Template Geometry in Packing and Ordering, 14 AiChE Annual Meeting, November 16, 2014.
- DJ Naczynski, **MC Tan**, RE Riman, CM Roth, PV Moghe, “Rare Earth Visions, Inc.: Illuminating a new frontier of optical imaging”. Rutgers University 2011 Entrepreneurship Day, New Brunswick, NJ, November 14, 2011.
- RE Riman, **MC Tan** “Energy efficient short wave infrared phosphors”, DARPA Proposers’ Day Workshop: Control Of Material Properties through Advanced Structures, Virginia, USA, June 2010.

- RE Riman, **MC Tan** “Short wave infrared”, DARPA Proposers’ Day Workshop: Control Of Material Properties through Advanced Structures, Virginia, USA, June 2010.
- RE Riman, **MC Tan** “Photon converters to enhance performance of solar technologies”, Venture Forum, New Jersey, USA, November 2010.
- RE Riman, **MC Tan** “Low-cost nanocomposites for implant imaging and light-activated implantable medical devices”, Venture Forum, New Jersey, USA, November 2010.
- **MC Tan**, GA Kumar, RE Riman, N Masoud, DE Murnick, “Hg free solid state lighting” Third Annual Rutgers Energy Symposium, New Jersey, USA, April 2008.

**RESEARCH PROJECTS** [ongoing projects in blue; in black are projects led before SUTD]

- [01/09/18 – 31/08/21] Rare Earth Nanoprobes for Optical Imaging and Disease Tracking (National Institutes of Health, USA, R01), *Overseas Principal Investigator*.
- [01/09/18 – 31/01/19] Printing of Scale-up Passive Cooling Materials Formulation onto Sportswear (ST Engineering Land Systems, Advanced Material Engineering Pte. Ltd.) *Principal Investigator*.
- [15/06/18 – 14/06/21] High-Gain Nanostructured Photonic Composites for On-Chip Waveguide Amplifiers (ASTAR Advanced Manufacturing and Engineering Individual Research Grant), *Principal Investigator*.
- [01/07/18 30/06/20] Establishing Predictive Design Principles for Deterministic Pore Architectures in Membranes for Environmental Applications (SUTD-IDC), *co-Investigator*.
- [01/01/18 – 12/31/18] Design and Fabrication of Flexible, Infrared Nanostructured Composite Photodetectors (SUTD-IDC), *Principal Investigator*.
- [01/01/17 – 12/31/18] CO<sub>2</sub> Capture Modules to Reduce Carbon Footprint of Underground Parking Spaces (SUTD-JTC Industrial Infrastructure Innovation Research Centre), *Principal Investigator*.
- [10/01/16 – 09/30/17] Electroencephalographic electrodes for continuous real-time cognitive function monitoring and interventions (SUTD-IDC), *co-Investigator*.
- [12/15/15 – 12/14/17] Invasion and Adhesion as Novel Antimalarial Scenarios and Targeting Thereof (MOE Tier 1), *co-Investigator*.
- [07/01/15 – 06/30/18] Dual-Modal Optical-based *in vivo* Imaging Using Rare-Earth Doped Nanoprobes (MOE Tier 2), *Principal Investigator*.
- [04/01/15 – 03/31/18] Singapore Centre for Frontiers in Digital Design and Manufacturing (National Research Foundation), *co-Investigator*.
- [09/01/14 – 08/31/17] Sustainable High Performance Building & Infrastructure Materials (SUTD-JTC Industrial Infrastructure Innovation Research Centre), *Principal Investigator*.
- [01/13/14 – 06/12/17] Systems-Level Design and Fabrication of Thermally-Stable Low Loss Nanostructured Photonic Composite Waveguide Amplifiers (ASTAR Public Sector Fund), *Principal Investigator*.
- [04/01/14 – 03/31/19] Rare Earth Nanoprobes for Optical Imaging and Disease Tracking (National Institutes of Health, USA, R01), *overseas collaborating Investigator*
- [06/01/12 – 05/31/15] Infrared three-dimensional imaging for cardiac procedures (SUTD-IDC), *co-Investigator*.
- [08/01/12 – 07/31/15] Design, modelling, and fabrication of nanostructured materials and sensing devices for healthcare monitoring (SUTD-ZJU), *Collaborator*.
- [12/01/11 – 11/30/14] Engineering Inorganic-Organic Interfaces for Biomedical Applications and Energy Efficient Functional Devices (SUTD Startup Research Grant), *Principal Investigator*.

- Albumin-Encapsulated Rare Earth Nanoprobes for Multifunctional Tissue Imaging (National Institutes of Health – R21), *team member*.
- In Situ XRD Characterization Laboratory for a Solvothermal Research Facility (Defense University Research Instrumentation Program, DURIP), *co-principal investigator*.
- Phosphors for Ductal Mapping (Department of Defense Congressionally Directed Medical Research Programs: Breast Cancer Research Program-Transformative Vision Award), *co-principal investigator*.
- Upconversion Photoelectric Materials – A New Advanced Structure Concept (Defense Advanced Research Projects Agency, DARPA Seedling Grant), *co-principal investigator*
- Efficient LED-excited Infrared Phosphors for Tunable Emission (Defense Advanced Research Projects Agency, DARPA Seedling Grant), *team member*.
- Microwave-powered solvothermal research facility for photonic nanomaterials (Defense University Research Instrumentation Program, DURIP), *team member*.
- High Efficiency Quantum-Cut Lighting (Defense Advanced Research Projects Agency, DARPA Seedling Grant), *team member*.