# Yiquan Wu

**Professor SOE**
Ceramic Engineering

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## Education

- PhD: Materials Science Imperial College London, 2005
- MS: Materials Science Shanghai Institute of Ceramics, University of Science & Technology of China, 2001
- BE: Materials Sciences & Engineering Wuhan University of Science and Technology, 1994

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## Specialties / Areas of Interest

RESEARCH INTERESTS Advanced Ceramics, Optical Materials, Nanostructured Materials for Energy, Biosolid Materials, Functional Films and Coatings

## Courses Taught

CEMS 314 Ceramic Processing Principles

CEMS 317 Sintering of Ceramics

CEMS 510 Advanced Material Processing

CEMS 216 Bonding and Structure of Materials

## Research, Publications, & Presentations

### Presentations

- Transparent ceramic chips for solid-state laser applications, 39th International Conference and Expo on Advanced Ceramics and Composites, January, 2015.
- (Keynote invited presentation) Research on rare-earth doped transparent multilayer ceramic disks, 10th International Symposium on Transparent Ceramics for Photonic Applications, Poland, 2014.
- Near-band-edge Photoluminescence of Y Doped CuAlO2 Nanofibers, Materials Science and Technology, Pittsburgh, PA, October, 2014.
- Transparent ceramic chips for photonic and optical applications, 5th International Congress of Ceramics, China, August, 2014.
- Divalent europium doped transparent ceramic scintillators, 5th International Congress of Ceramics, China, August, 2014.
- A new aqueous-organic tape casting system for fabrication of transparent ceramics, 38th International Conference & Exposition on Advanced Ceramics & Composites, Florida, 2014.
- Processing of transparent ceramics by designing a new spontaneous gelling system, 10th Pacific Rim Conference on Ceramic and Glass Technology, San Diego, California, 2013.
- Europium doped yttrium aluminum garnet transparent ceramics, 12th International Conference on Ceramic Processing Science, Portland, Oregon, 2013.
- Fast sintering of transparent optical nanoceramics, Materials Science and Technology 13, Montreal, Canada, 2013.
- Environmentally-friendly gel-casting of transparent optical ceramics, Materials Science and Technology 13, Montreal, Canada, 2013.
- Transparent laser ceramics with anisotropic crystallographic structures, 9th Laser Ceramics Symposium, Daejeon, South Korea , 2013.
- Processing of anisotropic transparent ceramics and single crystal conversion, 5th International Symposium on Advanced Ceramics, organized by Japan Society for the Promotion of Science, China, 2013.
- Densification and grain growth through fast sintering process, Materials Science and Technology, Pittsburgh, PA, October, 2012.
- Development of anisotropic Sr5(PO4)3F optical ceramics, Materials Science and Technology, Pittsburgh, PA, October, 2012.

## Research & Publications

- 2009-2011, Assistant research professor, Department of Mechanical Engineering, University of Rochester, USA
- 2006-2008, Research associate, Department of Mechanical Engineering & Materials Science, Center for Biologically Inspired Materials & Material Systems, Duke University, USA
- 2001-2005, Visiting scholar and Research assistant, Department of Materials, Imperial College London, Faculty of Engineering, University of Nottingham, England
- 1999-2001, Research assistant, National Key Laboratory of High Performance Ceramics and Superfine Microstructure, Shanghai Institute of Ceramics, China
- 1994-1998, Materials engineer, Division of Inorganic Nonmetallic Materials, Research Institute of Ma'anshan Iron & Steel Co. Ltd (Magang Technological Center), China

- 1993-1994 Research assistant, Materials Research Institute (Cultivation Base of National Key Laboratory of Refractories & Ceramics), Wuhan University of Science and Technology, China
- Y. Li, and Y. Wu*, "Transparent and luminescent ZnS ceramics consolidated by vacuum hot pressing method", in press, Journal of the American Ceramic Society, 2015.
- Q. Zhao, B. Zhang, A. Chang, and Y. Wu, "Electrical properties and aging mechanism of Y2O3-MCr0.5Mn0.5O3 (M = Sm, Gd) composite NTC ceramics", Journal of Materials Science: Materials in Electronics, 26 (6), 4221-4225, 2015.
- Y. Yang and Y. Wu*, "Environmentally benign processing of YAG transparent wafers," Optical Materials, Available, May 2015.
- Yin Liu, Yanlin Huang, Hyo Jin Seo, Yiquan Wu*, Blueshift in near-band-edge emission in Y3+doped CuAlO2 nanofibers. Optical Materials Express, 4:2602-2607, 2014.
- Yiquan Wu*, "Nanostructured Transparent Ceramics with an Anisotropic Crystalline Structure", Optical Materials Express, 4(10), 2026-2031, 2014.
- Yin Liu, Thomas L. Olson, Yiquan Wu*, "Luminescence and Microstructure of Nd Doped Y2Si2O7 Electrospun Fibers, Journal of American Ceramic Society, 97 (8), 2390-2393, 2014.
- Shi Chen, Yiquan Wu*, "Influence of Temperature on the Spark Plasma Sintering of Calcium Fluoride Ceramics", Journal of Materials Research, 29 (19) 2297-2302, 2014.
- Yan Yang, Yiquan Wu*, "Tape-casted Transparent Alumina Ceramic Wafers", Journal of Materials Research, 29 (19) 2312-2317, 2014.
- Bo Zhang, Aimin Chang, Qing Zhao, Haitao Ye, Yiquan Wu*, "Synthesis and Thermoelectric Properties of Yb-doped Ca0.9-xYbxLa0.1MnO3 Ceramics", Journal of Electronic Materials, 43 (11) 4048-4055, 2014.
- Yiquan Wu*, Electrohydrodynamic Atomization Processing Biologically Nanostructured Materials, Editorial, Bioceramics Development and Applications, 4(2) 2014.
- Bo Zhang, Qing Zhao, Aimin Chang, Yiyu Li, Yin Liu, Yiquan Wu*, "Spark Plasma Sintering of MgAl2O4-YCr0.5Mn0.5O3 Composite NTC Ceramics", Journal of the European Ceramic Society 34, 2989-2995, 2014.
- Bo Zhang, Qing Zhao, Aimin Chang, Haitao Ye, Shi Chen, Yiquan Wu*, "New Negative Temperature Coefficient Thermistor Ceramics in Mn-doped CaCu3-xMnxTi4O12 System", Ceramics International, 40(7) 11221-11227, 2014.
- Yiyu Li, Lihua Zhang, Kim Kisslinger, Yiquan Wu*, "Green Phosphorescence of Zinc Sulfide Optical Ceramics", Optical Materials Express, 4(6) 1140-1150, 2014.
- Bo Zhang, Qing Zhao, Aimin Chang, Yiyu Li, Yin Liu, Yiquan Wu*, "Electrical Conductivity Anomaly and X-ray Photoelectron Spectroscopy Investigation of YCr1-xMnxO3 NTC Ceramics", Applied Physics Letters, 104 (10), 102109, 2014.
- Bo Zhang, Qing Zhao, Aimin Chang, Yin Liu, Yiyu Li, Yiquan Wu*, "Synthesis of YCrO3 Ceramics through a Field-assisted Sintering Technique", Journal of Materials Science: Materials in Electronics, (25)1400-1403, 2014.
- Yin Liu, Michael Alberga, Yiquan Wu*, "Spark Plasma Sintering of Oxides and Carbide Dispersed Zirconia Inert Matrix Fuels", Ceramics International, 40(4) 5313-5320, 2014.

- B. Zhang, AM. Chang, Q. Zhao, HT. Ye, Y. Q. Wu*, "MgAl2O4-LaCr0.5Mn0.5O3 Composite Ceramics for High Temperature NTC Thermistors", Journal of Materials Science: Materials in Electronics 24: 4452-4456, 2014.
- Chen, S.; Wei, H.; Melcher, C. L. and W u, Y. Q*. "Spectroscopic Properties of Transparent Y3Al5O12: Eu Ceramics", Optical Materials Express, 3(12) 2022-2027, 2013.
- Shi Chen, Yiquan Wu*, "New Opportunities for Transparent Ceramics", Bulletin of American Ceramics Society, 2013(92)2: 32-37.
- Shi Chen, Lihua Zhang, Kim Kisslinger, Yiquan Wu*, "Transparent Li0.05Y3Al5O12:Ce3+0.01 Ceramics for Thermal Neutron Detection", Journal of the American Ceramics Society, 2013 (96) 4: 1067-1069.
- Shi Chen, Yiquan Wu*, Yan Yang, "Spark Plasma Sintering of Hexagonal Structure Yb3+ doped Sr5(PO4)3F Transparent Ceramics", Journal of the American Ceramics Society, 2013 (96) 6: 1694-1697.
- Shi Chen, Linlin Zhang, Yiquan Wu*, Guohong Zhou, Peng Liu, Yan Yang, Shiwei Wang, "Chelation-controlled compound transition of luminescent fluoride crystals", Materials Letters, 2013 (106): 326-331.
- Yiquan Wu*, Jing Du, Robert L. Clark, "Synthesis of Yb3+ doped Sr5(PO4)3F nanoparticles through co-precipitation", Materials Letters, 2013 (107) 15: 68-70.
- Wenliang Zhu, Yiquan Wu*, Jing Du, Andrea Leto, and Giuseppe Pezzotti, "Cathodoluminescence and Raman spectroscopic analyses of Nd- or Yb-doped Y2O3 transparent ceramics", Journal of Physical Chemistry A. 2013, 117 (17) 3599-3607.
- Chen, Shi, Yang, Yan, Zhou, Guohong, Wu, Yiquan*, Liu, Peng, Zhang, Fang, Wang, Shiwei, Trojan-Piegza, Joanna, Zych, Eugeniusz, "Characterization of afterglow-related spectroscopic effects in vacuum sintered Tb3+, Sr2+ doped Lu2O3 ceramics", Optical Materials, 2012 (35)2: 240-243.
- Zexuan Dong, Yiquan Wu*, Qin Wang, Chao Xie, Yanfang Ren, Robert L Clark "Reinforcement of electrospun membranes using nanoscale Al2O3 whiskers for improved tissue scaffolds", Journal of Biomedical Materials Research Part A, 100 A(4) (2012), 903-910.
- Supacharee Roddecha, Zexuan Dong, Yiquan Wu, Mitchell Anthamatten "Mechanical properties and ionic conductivity of electrospun quaternary ammonium ionomers", Journal of Membrane Science, 389 (2012) 478- 485.
- Nathan J. Jenness, Yiquan Wu, Robert L. Clark, "Fabrication of Three-dimensional Electrospun Microstructures using Phase Modulated Femtosecond Laser Pulses", Materials Letters, 66(2012)360-363.
- Zexuan Dong, Scott J. Kennedy, Yiquan Wu*, "Electrospinning Materials for Energy-related Applications and Devices", Journal of Power Sources, 196 (2011) 4886-490.
- Zexuan, Dong, Yiquan Wu*, Robert, Clark, "Thermodynamic Modeling and Investigation of the Formation of Electrospun Collagen Fibers", Langmuir, 27 (2011) 12417-12422.
- Yiquan Wu*, Zexuan Dong, Nathan J. Jenness, Robert L. Clark. "In-situ formation of Cu metal crystals within nanostructured ZnO electrospun fibers", Materials Letters, 65 (2011) 2683-2685.
- Yiquan Wu, A.Y. Vorobyev, Robert L Clark, Chunlei Guo, "Femtosecond Laser Machining of Electrospun Membranes", Applied Surface Science, 257(2011) 2432-2435.

- Yiquan Wu*, Zexuan Dong, Scott Wilson, Robert L. Clark, "Template-assisted Assembly of Electrospun Fibers", Polymer, 51 (2010) 3244-3248.
- Jing Du, Yiquan Wu, K. L. Choy, P. Shipway, "Structure, Properties and Gas Sensing Behavior of Cr2-xTixO3 Films Prepared by Electrostatic Spray Assisted Vapor Deposition, Thin Solid Films, 519 (4) 2010, 1293-1299.
- Yiquan Wu, I-Chien Liao, Scott Kennedy, Jun Wang, Jinzhi Du, Kam Leong, Robert Clark, "Electrosprayed core-shell microspheres for protein delivery", Chemical Communication, 46 (2010) 4743-4745.
- Jing Du, Yiquan Wu, K. L. Choy, and P. H. Shipway, "Structure Evolution and Stoichiometry Control of Pb(Zr, Ti)O3 Thick Films Fabricated by Electrospray Assisted Vapor Deposition", Applied Surface Science, 256 (2010) 4606-4611.
- Yiquan Wu, Scott Kennedy and Robert L. Clark, "Polymeric Particle Formation through Electrospraying at Low Atmospheric Pressure", Journal of Biomedical Materials Research B, 90 (2009) 381-387.
- Yiquan Wu, Andrew MacKay, Jonathan McDaniel, Ashutosh Chilkoti and Robert L. Clark, "Fabrication of Elastin-Like Polypeptide Nanoparticles for Drug Delivery by Electrospraying", Biomacromolecules, 10(2009) 19-24.
- Yiquan Wu and Robert L. Clark, "Electrohydrodynamic Atomization: a Versatile Process for Preparing Materials for Biomedical Applications", Journal of Biomaterials Science: Polymer Edition. 19 (2008) 573-601.
- Yiquan Wu, Matthew S. Johannes and Robert L. Clark, "AFM-based Voltage Assisted Nanoelectrospinning", Materials Letters, 62 (2008) 699-702.
- Yiquan Wu, Lisa A. Carnell and Robert L. Clark, "Control of Electrospun Mat Width Through the Use of Parallel Auxiliary Electrodes", Polymer, 48 (2007) 5653-5661.
- Yiquan Wu and Robert L. Clark, "Controllable Porous Polymer Particles Generated by Electrospraying", Journal of Colloid and Interface Science, 310 (2007) 529-535.
- Yiquan Wu, Jing Du, Kwang-Leong Choy and Larry L. Hench, "Laser Densification of Alumina Powder Beds Generated using Aerosol Assisted Spray Deposition", Journal of the European Ceramics Society, 27(2007)4727-4735.
- Yiquan Wu, Jing Du, Kwang-leong Choy and Larry L. Hench, "Fabrication of Titanium Dioxide Ceramics by Laser Sintering Green Layers Prepared via Aerosol Assisted Spray Deposition", Materials Science & Engineering A, 454-455 (2007) 148-155.
- Yiquan Wu and Kwang-Leong Choy, "Solid Freeform Fabrication of Alumina using Laser-Assisted ESAVD", Applied Surface Science, 252 (2006) 4809-4813.
- Yiquan Wu, Jing Du and Kwang-Leong Choy, "Novel Deposition of Columnar Y3Al5O12 Coatings by Electrostatic Spray Assisted Vapor Deposition", Journal of the American Ceramic Society, 89[1] 385-387 (2006).
- Jing Du, Yiquan Wu and Kwang-Leong Choy, "Controlled Synthesis of Gas Sensing Cr2-xTixO3 Films by Electrostatic Spray Assisted Vapour Deposition and their Structural Characterization", Thin Solid Films, 497[1-2] 42-47 (2006).
- Yiquan Wu*, Jing Du, Kwang-Leong Choy, Larry L. Hench and Jingkun Guo, "Formation of Interconnected Microstructural ZnAl2O4 Films Prepared by Sol-gel Method", Thin Solid Films, 472 [1-2] 150-156 (2005).

- Yiquan Wu, Kwang-Leong Choy and Larry L. Hench, "Laser Densification of TiO2 Films Prepared by Aerosol Assisted Vapour Deposition", Applied Surface Science, 247(2005) 378-383.
- Yiquan Wu, Larry L. Hench, Jing Du, Kwang-Leong Choy and Jingkun Guo "Preparation of Hydroxyapatite Fibers by Electrospinning Technique", Journal of the American Ceramic Society, 87[10] 1988-1991 (2004).
- Yiquan Wu, Larry L Hench and Kwang-Leong Choy, "Preparation of Alpha Alumina Platelets by Laser Scanning", Journal of the American Ceramic Society, 87[10] 1606-1608 (2004).
- Yiquan Wu and Kwang-Leong Choy, "Microstructure of Alumina Coatings Prepared by Aerosol Assisted Spray Deposition", Surface and Coatings Technology, 180-181 (2004) 436-440.
- Yiquan Wu*, Yufeng Zhang, Kwang-Leong Choy and Jingkun Guo, "Liquid-phase Sintering of Alumina with YSiAlON Oxynitride Glass", Materials Letters, 57 (2003) 3521-3525.
- Yiquan Wu*, Yufeng Zhang, Giuseppe Pezzotti and Jingkun Guo, "Effect of Glass Additions on Strength and Toughness of Polycrystalline Alumina", Journal of the European Ceramics Society, 22 (2002) 159-164.
- Yiquan Wu*, Yufeng Zhang, Giuseppe Pezzotti and Jingkun Guo, "Influence of AlF3 and ZnF2 on the Phase Transformation of Gamma to Alpha Alumina", Materials Letters, 52 (2002) 366-369.
- Yiquan Wu*, Yufeng Zhang, Xiaoxian Huang and Jingkun Guo, "Microstructure Development and Mechanical Properties of Self-Reinforced Alumina with CAS Addition", Journal of the European Ceramics Society, 21 (2001) 581-587.
- Yiquan Wu*, Yufeng Zhang, Jingkun Guo and Yawei Li, "New Application of Some High Technologies in Refractories", China's Refractories, 10 [4] (2001) 21-25.
- Yiquan Wu*, Yufeng Zhang, Xiaoxian Huang and Jingkun Gun, "Preparation of Platelike Nano Alumina Particles", Ceramics International, 27 (2001) 265-268.
- Yiquan Wu*, Yufeng Zhang, Shiwei Wang and Jingkun Guo, "In-situ Synthesis of Rodlike LaAl11O18 in Al2O3 Powder by a Coprecipitation Method", Journal of the European Ceramics Society, 21 (2001) 919-923.
- Yiquan Wu*, Yufeng Zhang, Xiaoxian Huang, Baoshun Li and Jingkun Guo, "Preparation, Sintering and Fracture Behavior of Al2O3/LaAl11O18 Ceramic Composite", Journal of Materials Science, 36 (2001) 4195-4199.
- Yiquan Wu*, Yufeng Zhang, Xiaoxian Huang and Jingkun Guo, "In-situ Growth Needlelike LaAl11O18 Reinforcement Alumina Composites", Ceramics International, 27 (2001) 903-906.

## Awards/Honors

NSF CAREER Award, NSF, 2016 Global Star Award, American Ceramic Society's Engineering Ceramics Division, 2016
Global Star Award, American Ceramic Society's Engineering Ceramics Division, 2016 AFOSR-YIP Award, US Air Force, 2010
AFOSR-YIP Award, US Air Force, 2010 K.C. Wong Education Foundation Award, Chinese Academy of Sciences, 2010

K.C. Wong Education Foundation Award, Chinese Academy of Sciences, 2010
International Travel Grant Award, Royal Academy of Engineering, UK 2004
International Travel Grant Award, Royal Academy of Engineering, UK 2004
Overseas Research Scholarship from Universities UK (British government) 2001-2004
Overseas Research Scholarship from Universities UK (British government) 2001-2004 Imperial College Fellowship, 2001-2004
Imperial College Fellowship, 2001-2004 Presidential Award of Chinese Academy of Sciences (CAS), 2001
Presidential Award of Chinese Academy of Sciences (CAS), 2001 Yan Dongsheng Prize, Shanghai Institute of Ceramics, CAS, 2001
Yan Dongsheng Prize, Shanghai Institute of Ceramics, CAS, 2001 Outstanding Research, Maanshan Iron and Steel Co. Ltd, China, 1995
Outstanding Research, Maanshan Iron and Steel Co. Ltd, China, 1995 University Scholarship, Wuhan University of Science and Technology, 1991-1994
University Scholarship, Wuhan University of Science and Technology, 1991-1994

## Professional Experience

- Vice president of the ACerS' ceramics education council
- Program co-chair 2016-2017, Basic Science Division, American Ceramic Society.
- Member of International Advisory Board of 6th International Congress of Ceramics, Germany, August 2016.
- Symposium organizer, 6th International Congress of Ceramics (ICC), Germany, August 2016.
- Symposium organizer, 9th International Conference on High Temperature Ceramic Matrix Composites (HTCMC-9), Canada, June, 2016.
- Symposium organizer, 40th International Conference and Expo on Advanced Ceramics and Composites (ICACC), 2016.
- Symposium organizer, ACerS' Glass & Optical Materials Division Annual Meeting, 2016.
- Symposium organizer, Materials Science and Technology Conference, 2016.
- Symposium Organizer, 11th International Conference of Pacific Rim Ceramic Societies, 2015
- Symposium Organizer, 39th International Conference and Expo on Advanced Ceramics and Composites , 2015
- Symposium Organizer, 11th International Symposium on Ceramic Materials and Components for Energy and Environmental Applications
- Symposium Organizer, 5th International Congress of Ceramics, Beijing, 2014
- Symposium Organizer, Materials Science and Technology Conference (MS & T), 2015
- International Scientific Advisory Committee for 5th International Congress of Ceramics, 2014
- Editorial Board of "Bioceramics Development and Applications"
- Guest Editor: Focus Issue for "Journal of Materials Research" on Optical Ceramics Sciences, 2014
- Session Chair for 38th International Conference & Exposition on Advanced Ceramics & Composites, 2014, 2015

- Session Chair for 5th International Congress of Ceramics, Beijing, 2014
- Session Chair for the Materials Science & Technology Meeting, Pittsburgh PA, 2013, 2014, 2015
- Session Chair for the 12th International Conference on Ceramic Processing Science, Portland, 2013