YUSHAN YAN

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Yushan Yan is the Henry B. duPont Chair in Chemical and Biomolecular Engineering at the University of Delaware (UD) (2019-date). His previous positions at UD includes Distinguished Engineering Professor (2011-2019) and the Founding Associate Dean for Research and Entrepreneurship of the College of Engineering at the University of Delaware (UD) (2014-2018).

He studied Chemical Physics (BS) at the University of Science and Technology of China (1983-1988), Heterogeneous Catalysis at the Dalian Institute of Chemical Physics of the Chinese Academy of Sciences (1988-1992), and Chemical Engineering (PhD) at the California Institute of Technology (1992-1996).

Before joining the faculty at UD, he worked for AlliedSignal Inc. (Senior Staff Engineer and Project Leader, 1996-1998) and the University of California Riverside (UCR) (Assistant Prof, 1998; Associate Prof, 2002; Prof, 2005; University Scholar, 2006-2010; University of California Presidential Chair 2010-2011).

His major national/international recognitions include Fellow of the American Association for the Advancement of Science (2008), the International Zeolite Association's Donald Breck Award (2010, the highest award given by the association once every three years), the American Institute of Chemical Engineers' Nanoscale Science and Engineering Forum Award (2016), the Electrochemical Society's Energy Technology Division Research Award (2018), Fellow of the National Academy of Inventors (2019), the American Institute of Chemical Engineers' Braskem Award for Excellence in Materials Science and Engineering (2019), Fellow of the Electrochemical Society (2019) (15 max per year), and Highly Cited Researchers from Web of Science.

His research has been supported by industry and governmental agencies including the National Science Foundation (e.g., NIRT), Department of Defense (e.g., SERDP and MURI), Environmental Protection Agency (e.g., TSE), and Department of Energy (e.g., EERE, ARPA-E, and BES). Notably he was one of 37 awardees in the Department of Energy's ARPA-E OPEN 2009 for his fuel cell technology (the inaugural open call for proposals that received about 3700 concept papers), one of 66 awardees in OPEN 2012 for his redox flow battery concept (the 2nd open call for proposals that received about 6700 concept papers) and one of 40 awardees of OPEN2018 for his CO2 removal technologies.

In the past, he supervised 30+ postdocs, 30+ PhD students, 10+ MS students, 10+ visiting scholars, 30+ undergraduate students, and 7 high school students. 20+ of his former postdocs and graduate students hold faculty positions in China, Australia, Canada, Mexico, and the US.

He has been an inventor on 25+ issued and pending patents, some of which were licensed to form several startup companies including NanoH2O and OH-Energy. He has served these startups in the capacity of cofounder, chief scientific advisor, or advisory board member. The nanocomposite desalination membrane technology he co-invented was commercialized by NanoH2O, which was acquired by LG Chemicals for $200+ million in 2014. His most recent venture is W7energy which he founded with his postdocs to commercialize the new polymers invented in his lab. W7energy currently has 7 employees.

His research has led to 260+ published articles that have been widely cited in the scientific community (h-index = 75, average citation / paper = 75, total citation = 20,000+, **Web of Science**; h-index = 86, total citation = 26,000+, **Google Scholar**) and extensively covered by the media, e.g., New Scientist, C&EN News (ACS), Interface (ECS), Materials Today, Materials 360 (MRS), Chemical Engineering Progress (AIChE), Business Week, China Press, Chinese Daily News, The News Journal, CNN.com, CNBC, KABC, and VOA.

Over the past 20 years as a faculty, he has taught the majority of the core chemical engineering undergraduate courses and consistently received high marks from his students.

He has organized/chaired numerous sessions in national and international conferences. He was the Vice Chair of the 2011 and the chair of the 2013 Gordon Conference on Nanoporous Materials.

He has reviewed for numerous journals (e.g., Science, Science Advances, Nature, Nature Chemistry, Nature Materials, Nature Energy, Nature Nanotechnology, Nature Communications, Journal of the American Society, Angewandte Chemie International Edition, Energy and Environmental Science) and funding agencies (e.g., NSF, DOE, DoD, and many international organizations including RGC of Hong Kong).

He has delivered 200+ invited lectures including Plenary, Keynote, and Named Lectures at major international conferences and universities.

He is an experienced administrator and has served as Department Chair in a fledging department and the Founding Associate Dean for Research and Entrepreneurship in a well-established college of engineering.

As a Department Chair at UCR, he led the effort to make his young department (formed in 1998, the year he joined the department) to achieve the profile of a top-25 chemical engineering department in the US. By all numbers that can be objectively measured using data from the year of 2000 and onward including # of publications/yr/faculty, citations/publication, research $/faculty, and # of PhD students/faculty, his department realized that goal. He oversaw the growth of the department to 400+ undergraduate students, 120+ PhD students and ~ $10M/yr external research funding for a faculty of 13.

As the Founding Associate Dean for Research and Entrepreneurship, he set the goal of promoting large scale research and establishing an entrepreneurship culture in the College of Engineering and UD. He led the administrative support for the successful establishment of two large Manufacturing USA Institutes (NIIMBL headquartered at UD and RAPID headquartered at AIChE). Each institute captured $70M/5yr federal and $140M+/5yr industrial support. In fact, he initiated and led the early effort to organize the process intensification proposal that was eventually merged into RAPID. During his tenure, UD was also awarded a $20 M grant from the National Science Foundation and a $12.8M EFRC (Energy Frontier Research Center) grant from the Department of Energy. UD Engineering had the highest research expenditure in its history in fiscal year 2018.

For entrepreneurship effort, he co-led with the Horn Entrepreneurship Director the effort to establish the BlueHen Proof of Concept Fund (POC) and the Postdoctoral Innovation Fellow (PIF) program to support startups by UD faculty, undergrad and grad students (POC) and graduating PhDs wishing to commercialize their thesis research (PIF). Each UD startup can receive $75,000 for supporting prototyping and salary in the case of PIF. He co-raised ~$2M for the two funds from foundations and private donors. He also co-led the effort to establish an integrated entrepreneurship/startup ecosystem by integrating the NSF I-Corp Site, I-Corp Team, POC/PIF, SBIR0, and SBIR/STTR, which can provide about $350k non dilutional supports for a UD startup.

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EDUCATION

1997	**PhD, Chemical Engineering** *California Institute of Technology*, Pasadena, CA
1988	**BS, Chemical Physics** *University of Science and Technology of China*, Hefei, China

EMPLOYMENT

07/2011 – date	**Department of Chemical and Biomolecular Engineering, University of Delaware,** Newark, DE *Founding Associate Dean for Research and Entrepreneurship, College of Engineering (2014-2018); Distinguished Engineering Professor (2011-2019); Henry B duPont Chair of Chemical and Biomolecular Engineering (2019-date)*
11/2017 – date	**W7energy LLC,** Hockessin, DE *Founder, CEO, and President.* W7energy is dedicated to commercializing a new class of hydroxide exchange membranes invented in the Yan Group at the University of Delaware
09/1998 – 07/2011	**Department of Chemical and Environmental Engineering, University of California, Riverside,** Riverside, CA *Department Chair (2008-2011), University of California Presidential Chair (2010), University Scholar Professor (2006), Professor (2005), Associate Professor (2002), Assistant Professor (1998)*
01/2007 – 07/2007	**Chemical Engineering, California Institute of Technology,** Pasadena, CA Visiting Associate
09/1996 – 09/1998	**AlliedSignal Inc.,** Des Plaines, IL Senior Staff Engineer/Project Leader
09/1992 – 08/1996	**Chemical Engineering, California Institute of Technology,** Pasadena, CA Research Assistant
09/1988 – 09/1992	**Heterogeneous Catalysis, Dalian Inst. Chem. Phys., Chinese Academy of Sciences**, Dalian, China Research Assistant

HONORS AND RECOGNITIONS

2019 Highly Cited Researchers, Web of Science
2019 Fellow of the Electrochemical Society
2019 Braskem Award for Excellence in Materials Science and Engineering, The American Institute of Chemical Engineers

2019 Fellow of National Academy of Inventors
2018 Energy Technology Division Research Award, The Electrochemical Society
2016 Nanoscale Science and Engineering Forum Award, American Institute of Chemical Engineers
2015 Institute of Advanced Studies Lecture, *Hong Kong University of Science and Technology*
2011-2016 Qiushi Professor (Visiting), *Zhejiang University*
2011-2014 Hengyi Professor (Visiting), *Zhejiang University*
2011 27th Outstanding Alumni Lecture, *Dalian Institute of Chemical Physics, Chinese Academy of Sciences*
2011 Distinguished Engineering Professor, *University of Delaware*
2010 Donald Breck Award, *International Zeolite Association*
2010 Presidential Chair, *University of California*
2008 6th Annual Proggy Award, *Best Scientific Innovation, PETA*
2008 Fellow, *American Association for the Advancement of Science*
2008 ChangJiang Professor (Visiting at *Zhejiang University), Chinese Ministry of Education*
2007 Top 100 Most Cited Papers (28th) Since 1975, *Ind. Eng. Chem. Res. American Chemical Society*
2006 University Scholar (inaugural), *University of California, Riverside*
2003 Overseas Young Investigator, *Chinese Academy of Sciences*
2001 Faculty Development Award, *University of California, Riverside*
2000 Regent's Faculty Fellowship, *University of California, Riverside*
1998 Guest Professor, *Department of Chemistry, Jilin University, China*
1997 Recognition of Contribution, *AlliedSignal Inc.*
1994 Li Ming Scholarship Award, *California Institute of Technology*
1990 Presidential Award for Excellence, *Chinese Academy of Sciences*

PROFESSIONAL MEMBERSHIP

- American Institute of Chemical Engineers (AIChE)
- American Chemical Society (ACS)
- Electrochemical Society (ECS)
- Materials Research Society (MRS)
- North American Membrane Society (NAMS)
- International Zeolite Association (IZC)

POPULAR PRESS

New Scientist, C&EN News (ACS), Interface (ECS), Materials Today, Materials 360 (MRS), Chemical Engineering Progress (AIChE), Business Week, China Press, Chinese Daily News, The News Journal, CNN.com, CNBC, KABC, and VOA.

JOURNAL ARTICLES

- 260+ papers
- **19,000+ total citations, h index = 75**, **Average citation/paper = 75, Web of Science**
- **26,000+ total citations, h index = 86, Google Scholar**

1.

INVITED LECTURES

1. "Zeolite ZSM-5 membranes for separation and catalysis", **9/27/99**, Department of Chemistry, University of California, Riverside, California.
2. "Assembly of nanoporous thin films", **10/14/99**, Southern California Society for Microscopy and Microanalysis (SCSMM), University of California, Irvine, California.
3. "Zeolite thin films as low *k* inter-metal dielectrics", **1/28/00**, Honeywell Wafer Fabrication Materials, STAR Center, Sunnyvale, California.
4. "Zeolite thin films and porous materials", **2/17/00**, Praxair Research Center, Tonawanda, New York.
5. "Zeolite membranes by in-situ crystallization", **3/10/00**, Kennecott Undergraduate Seminar, Chemical Engineering, University of Nevada at Reno, Reno, Nevada.
6. "Design, synthesis, and novel applications of zeolite thin film and coatings", **3/10/00**, Research Seminar, Chemical Engineering, University of Nevada at Reno, Reno, Nevada.
7. "Design, synthesis, and novel applications of zeolite thin film and coatings", **8/4/00**, Department of Applied Chemistry, Waseda University, Tokyo, Japan.
8. "Design, synthesis, and novel applications of zeolite thin film and coatings", **8/12/00**, Department of Chemistry, Jilin University, Changchun, China.
9. "Zeolite low-*k* dielectrics", **3/19/01**, Advanced Process Research & Development Laboratory (APRDL) of Motorola and AMD, Austin, Texas.
10. "Zeolite low-*k* dielectrics", **3/19/01**, International Sematech, Austin, Texas.
11. "Zeolite low-*k* dielectrics", **4/20/01**, Advanced Micro Devices (AMD), Sunnyvale, California.
12. "Design, synthesis, and novel applications of zeolite thin film and coatings", **5/15/01**, Chemical Engineering, University of Louisville, Louisville, Kentucky.
13. "Zeolite low-*k* dielectrics", **8/2/01**, Novellus Systems, San Jose, California.
14. "Design, synthesis, and environmental applications of zeolite based membrane and coatings", **9/10/01**, United States Environmental Protection Agency, Washington D.C.
15. "Design, synthesis, and novel applications of zeolite thin film and coatings", **9/20/01**, Chemical Engineering, University of Southern California, Los Angeles, California.
16. "Design, synthesis, and novel applications of zeolite thin film and coatings", **10/3/01**, Chemical Engineering, University of Rochester, Rochester, New York.
17. "Design, synthesis, and novel applications of zeolite thin film and coatings", **10/15/01**, Chemical Engineering and Materials Science, University of California, Davis, California.
18. "Fuel cells – power for the future", **2/27/02,** American Chemical Society, Orange County Section, University of California, Riverside, California.
19. "Zeolite nanoparticles: building blocks for hierarchical porous structures", **4/29/02**, American Ceramic Society, St. Louis, Missouri.
20. "Silica zeolite low-*k* dielectrics", **7/12/02**, Honeywell International, Sunnyvale, California.
21. "Silica zeolite low-*k* dielectrics", **9/27/02**, Advanced Micro Devices (AMD), Sunnyvale, California.
22. "Silica zeolite low-*k* dielectric thin films", **11/15/02**, Electrical Engineering and Computer Science, University of California, Berkeley, California.
23. "Polymer-zeolite nanocomposite membranes", **11/18/02**, Twentieth Annual Membrane/Separations Technology Planning Conference, Newton, Massachusetts.
24. "Design, synthesis, and novel applications of zeolite thin film and coatings", **11/21/02**,

Chemical Engineering, University of Massachusetts, Amherst, Massachusetts.

25. "Zeolite films: from chips to space station", **12/2/02,** Oak Ridge National Laboratory, Tennessee.
26. "Zeolite films: from chips to space station", **1/17/03,** Chemical Engineering, University of California at Los Angeles, California.
27. "Zeolite films: from chips to space station", **2/6/02,** Chemical Engineering, Northwestern University, Evanston, Illinois.
28. "Zeolite thin films", **2/14/03**, First UC Symposium of Surface Science, University of California, Riverside, CA.
29. "Silica zeolite low-*k* dielectric thin films", **4/4/03**, T. J. Watson Research Center, Yorktown Heights, New York.
30. "Silica zeolite low-*k* dielectric thin films", **4/4/03**, Engelhard, Iselin, New Jersey.
31. "Zeolite films: from chips to space station", **4/10/03**, Chemical Engineering, University of California, Santa Barbara, California.
32. "Zeolite nanoparticles: building blocks for hierarchical porous structures", **4/15/03**, Chemical Engineering, University of Southern California, Los Angeles, California.
33. "Microporous and mesoporous silica low-*k* dielectric thin films for computer chips", **8/1/03**, Pre-Conference School, The International Symposium on Zeolites and Microporous Crystals (ZMPC2003), The University of Tokyo, Japan (Cancelled due to SARS).
34. "Zeolite thin films: from chips to space station", The International Symposium on Zeolites and Microporous Crystals (ZMPC2003), **8/3-6/03**, Sapporo, Japan (Cancelled due to SARS).
35. "Silica zeolite low-*k* dielectric thin films", **8/20/03**, Intel, Portland, Oregon.
36. "Hierarchically porous silica hollow fibers by spider silk templating", **10/7/03**, The 36th Annual Symposium of the Southern California American Vacuum Society Meeting, Anaheim, California.
37. "Design, synthesis and novel applications of zeolite nanoparticles", **10/20/03**, The 55th Pacific Coast Regional and Basic Science Division Fall Meeting of the American Ceramic Society, Oakland, California.
38. "Zeolite nanocomposite membranes and carbon nanotube based electrodes for fuel cells", **11/9/03-11/10/03**, The Knowledge Foundation's 4th Annual International Conference NANOSTRUCTURED MATERIALS 2003 – Production and Application in Fuel Cells & other Energy Devices, Miami Beach, Florida.
39. "Zeolite thin films – from chips to space station", **11/13/03**, Department of Chemical Engineering, California Institute of Technology, California.
40. "Zeolite thin films – from chips to space station", **12/12/03**, Department of Chemistry, Fudan University, Shanghai, China.
41. "Zeolite thin films: from chips to space station", **12/22/03**, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China.
42. "Zeolite nanoparticles: building blocks for hierarchical porous structures and functional films", **12/26/03,** Department of Chemistry, Jilin University, Changchun, China.
43. "Zeolite nanoparticles: from computer chips to fuel cells", **3/9/04,** Nanoparticles 2004, Orlando, Florida.
44. "Polymer-zeolite nanocomposite membranes for PEM fuel cells and gas separation", **3/29/04,** Session of Nanotechnology and the Environment, 2004 ACS Annual Meeting, Anaheim, California.
45. "Silica Zeolite Low-*k* Dielectric Films", **3/28/04**, Session of Polymers in Micro- and Nano-Electronics, 2004 ACS Annual Meeting, Anaheim, California.
46. "Zeolite thin films: from chips to space station", **4/21/04**, Department of Chemistry, Georgetown University, Washington D.C.
47. "Zeolite thin films: from chips to space station", **9/23/04**, Department of Chemical Engineering, Ohio State University, Columbus, Ohio.

48. "Fuel cells: acid functionalized zeolite polymer nanocomposite membranes and carbon nanotube based electrode catalyst", **11/10/04** [Cancelled due to illness]**,** Department of Chemistry, University of California, Santa Barbara, California.
49. "Portable power: a high energy density and low cost fuel cell", **11/11/04,** PROJECT T2 A Technology Transfer Conference, Larta Institute, Los Angeles, California.
50. "Silica zeolite low-*k* films", **12/16/04,** Chevron-Texaco Research Center, Richmond, California.
51. "Portable power: a high energy density and low cost fuel cell", **12/16/04,** Nanosys Inc., Palo Alto, California.
52. "Carbon nanotube based electrocatalysts for fuel cells", **3/16/05,** Murphree Award Symposium in honor of M. E. Davis at the 2005 American Chemical Society Annual Meeting, San Diego, California.
53. "Zeolite rhin films and fuel cells", **3/22/05,** UOP, Des Plaines, Illinois.
54. "Carbon nanotube based electrocatalysts for fuel cells", **5/19/05,** Oklahoma State Nanonet Conference, Oklahoma State University, Stillwater, Oklahoma.
55. "Zeolite Thin Films: From Computer Chips to Space Station", **Gordon Research Conference** on Zeolite and Layer Materials, 7/3/05-7/8/05, Mount Holyoke College, South Hadley, Massachusetts.
56. "Zeolite thin films: from chips to space station", **9/20/05**, Department of Chemical & Petroleum Engineering, University of Kansas, Lawrence, Kansas.
57. "Zeolite thin films: from chips to space station", **10/12/05,** Department of Chemistry, University of La Verne, La Verne, California.
58. "Zeolite thin films: from chips to space station", **12/15/05,** PACIFICHEM 2005, Honolulu, Hawaii.
59. "Zeolite thin films: from chips to space station", **3/1/06,** Department of Chemistry, University of California Riverside, Riverside, California.
60. "Engineering of zeolite coatings for corrosion protection of aluminum alloys", **3/12/06-3/16/06**, The Research Topical Symposium (RTS) – Smart Coatings: Advanced Function Using New Materials, at the 2006 Annual Meeting of the National Association for Corrosion Engineers, San Diego, California.
61. "Carbon nanotube supported electrocatalysts for hydrogen and methanol fuel cells", **3/12/06-3/16/06**, The 135th TMS Annual Meeting, San Antonio, Texas.
62. "Engineering and assembly of zeolite nanoparticles: from chips to fuel cells", **3/26/06-3/30/06**, Reaction and Supramolecular Assembly in Complex Fluids at the 2006 American Chemical Society Annual Meeting, Atlanta, Georgia.
63. "Carbon nanotube supported electrocatalysts for hydrogen and methanol fuel cells", **3/26/06-3/30/06**, Nanoparticles in Energy Processes: Friend & Foe III. Nanoparticle-Based Catalysts and Sorbents at the 2006 American Chemical Society Annual Meeting, Atlanta, Georgia.
64. "Advancing fuel cell technology by carbon nanotubes and zeolite nanoparticles", **5/1/06,** Virginia Tech, Department of Chemical Engineering, Blacksburg, Virginia.
65. "Novel applications of zeolite thin films: past, present, and the future", **7/17/06,** Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China.
66. "Zeolite thin films: from chips to space station", **7/20/06,** Dalian University of Technology, School of Chemical Engineering, Dalian, China.
67. "Pure-silica-zeolite low-dielectric-constant films: past, present, and the future", **7/29/06**, Pre-conference School, the International Symposium on Zeolites and Microporous Crystals (ZMPC2006), Tokyo, Japan.
68. "Zeolite thin films: from chips to space station" **[Keynote Lecture]**, 7/30/06-8/2/06, The International Symposium on Zeolites and Microporous Crystals (ZMPC2006), Yonago, Japan.
69. "Zeolite thin films: from chips to space station – a progress report from 2000", **8/9/06,** Jilin

University, Department of Chemistry, Changchun, China.

70. "Zeolite thin films: from chips to space station", **8/18/06,** Zhejiang University of Technology, Hangzhou, China.
71. "Novel applications of zeolite thin films: past, present, and the future", **8/21/06,** Zhejiang University, Hangzhou, China.
72. "Nanotechnology for cheaper and more durable fuel cells", **3/8/07,** University of California – Canada Energy Workshop, University of California at Davis, CA.
73. "Nanotechnology for cheaper and more durable fuel cells", **3/29/07,** Department of Chemical Engineering, California Institute of Technology, Pasadena, CA.
74. "Nanotechnology for cheaper and more durable fuel cells", **4/13/07,** UC System-Wide Technology Transfer Forum on NANOTECHNOLOGY, San Francisco, CA.
75. "Nanotechnology for cheaper and more durable fuel cells", **8/6/07,** Jilin University, Department of Chemistry, Changchun, China.
76. "Nanotechnology for cheaper and more durable fuel cells", **8/10/07,** Peking University, Department of Chemistry, Beijing, China.
77. "Advanced applications of zeolite thin films: beyond separation and catalysis" **[Keynote Lecture]**, **8/12/07-8/17/07**, 15th International Zeolite Conference, Beijing, China.
78. "Zeolite thin films: from computer chips to space station", **8/18/07,** Institute of Process Engineering, Chinese Academy of Sciences, Beijing, Beijing, China.
79. "Nanotechnology for cheaper and more durable fuel cells", **8/23/07,** Zhejiang University, Department of Chemical and Biological Engineering, Hangzhou, China.
80. "Nanotechnology for cheaper and more durable fuel cells", **10/5/07,** University of California, Los Angeles, Department of Mechanical and Aerospace Engineering, Los Angles, California.
81. "Nanotechnology for cheaper and more durable fuel cells", **12/14/07,** University of California, Los Angeles, Department of Materials Science, Los Angles, California.
82. "Zeolite thin films and coatings", **1/10/08,** Qualcomm (broadcasted to their worldwide locations), San Jose, California.
83. "Nanotechnology for cheaper and more durable fuel cells", **1/25/08,** Arizona State University, Department of Chemical Engineering, Phoenix, Arizona.
84. "Nanotechnology for cheaper and more durable fuel cells", **2/12/08,** Georgia Institute of Technology, Department of Materials Science and Engineering, Atlanta, Georgia.
85. "Zeolite Thin Films and Fuel Cells", **3/28/08**, Pacific Northwest National Lab, Washington.
86. "Zeolite thin films: From computer chips to space station", **4/15/08,** Kansas State University, Department of Chemical Engineering, Manhattan, Kansas.
87. "Zeolite Thin Films for Energy, Environment, and Electronics", **5/23/08,** Acceptance Lecture of Changjiang Schalor Award, Scholl of Chemical Engineering and Materials Science, Zhejiang University, Hangzhou, China.
88. "Nanotechnology for cheaper and more durable fuel cells", **5/26/08,** Dalian Institute of Chemical Physics Symposium (XVI) on Fuel Cells, Dalian, China.
89. "Materials for Sustainable Energy: The Next Frontier for Chemical Engineering", **7/26/08**, The 34th West Lake Forum, Zhejiang University, Hangzhou, China.
90. "Zeolite thin films: From computer chips to space station", **10/9/08,** Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, Minnesota.
91. "Zeolite thin films: From computer chips to space station", **10/22/08**, Department of Chemical Engineering, Texas A&M University, College Station, Texas.
92. "Fuel cell vehicles of the future: The materials challenges to make it real". **12/3/08**, University of California, Palm Desert Graduate Center, Palm Desert, California.
93. "Zeolite thin films: From computer chips to space station", **1/18/09**, Jilin University Zhuhai Workshop on Porous Materials, Zhuhai, China.
94. "New fuel cell materials: Low-Pt and non-Pt catalysts and hydroxide exchange membranes", **2/16 – 2/17/09**, Vancouver to Northeast USA Fuel Cell and Hydrogen Cluster Connection

Workshop, Vancouver, Canada.

95. "Fuel cell vehicles of the future: The materials challenges to make it real", **4/4/09**, La Verne University, La Verne, CA.
96. Panelist, "Energy Summit", Coachella Valley Association of Governors, **4/17/09,** Palm Springs, CA
97. "Nanotechnology for cheaper and more durable fuel cells", **7/3/09,** The 4th Sino-US Nano Meeting , July 2-3, 2009, USTC, Hefei, China
98. "Nanotechnology for cheaper and more durable fuel cells", **8/11/09**, Chemistry Department, Zhejiang University, Hangzhou China.
99. "Nanotechnology for cheaper and more durable fuel cells", **8/15/09**, 2009 China – Workshop on Fuel Cell Science and Technology, Shanghai Jiao Tong University, China
100. "Zeolite thin films: From computer chips to space station" **8/17/09 (Distinguished Lecture)**, Changchun Institute of Applied Chemistry, Changchun, China.
101. "Quaternary Phophonium based Polymers: A New Class of Hydroxide Exchange Membranes", **9/10/09**, 3rd Sunrise Springs Fuel Cell Workshop, Santa Fe, NM.
102. "Zeolite thin films: From computer chips to space station**", 10/14/09 (Plenary Lecture),** The 15th Chinese National Zeolite Conference, Luoyang, Henan, China.
103. "Nanotechnology for cheaper and more durable fuel cells", **10/28/09**, Department of Chemical Engineering, Yale University, New Haven, CT
104. "Nanotechnology for cheaper and more durable fuel cells", **2/1/10**, Department of Electrical Engineering, University of California, Riverside, CA.
105. "The Next 20 Years in Energy:Moving toward a clean/safe/sustainable energy future," **3/10/10,** Bourns College of Engineering 20th Anniversary Celebration, University of California, Riverside, CA.
106. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future,"**3/17/10**, Catalysis Center, University of Delaware.
107. "Zeolite Thin Films: From computer chips to space station", **5/23-5/26/10 (Plenary Lecture**), The 5th International Zeolite Membrane Meeting, Loutraki, Greece.
108. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future", **6/5/10**, 5th Sino-US Nano Forum, Suzhou Institute of Nanotechnology and Nanobioncs (SINANO), Chinese Academy of Sciences, Suzhou, China.
109. "Solar hydrogen and fuel cells: Toward a clean safe and sustainable energy future", **6/10/10**, Department of Chemistry, Fudan University, China.
110. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **7/11/10**, 8th International Symposium on New Materials and Nanomaterials for Electrochemical Systems, Shanghai, China.
111. "Zeolite thin films: From computer chips to space station", **7/16/10**, Research Institute of Petroleum Processing, Sinopec, Beijing, China.
112. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **7/26/10**, Gordon Research Conference on Membranes, New London, NH.
113. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **8/24/10 (Plenary Lecture)**, The American Chemical Society Annual Fall Meeting, Boston, MA.
114. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **8/31/10,** Department of Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champion, IL.
115. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **9/28/10**, F-Cell, Stuttgart, Germany.
116. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future",**10/8/10**, Department of Chemical Engineering, University of California, Berkeley
117. "Polymer hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen",

10/10 – 10/15/10, The Electrochemical Society Meeting, Las Vegas, NV.

118. "Fuel cells and solar hydrogen: Toward a clean safe and sustainable energy future", **11/16/10,** Department of Chemical Engineering, University of Texas, Austin, TX.
119. "Zeolite thin films: From computer chips to space station" **1/5/10**, Department of Chemical Engineering, Nanjing University of Technology, Nanjing, China.
120. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **1/28/11**, Energy Materials Center, Cornell University, Ithaca, NY
121. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **3/1/11**, Department of Chemical Engineering, University of New Mexico
122. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **3/18/11**, Department of Chemical Engineering, Michigan Technological University.
123. "Membranes: From zeolites to polymers", **3/29/11**, E. V. Murphree Award Symposium in honor of Norman Li, American Chemical Society Annual Meeting, Anaheim, CA.
124. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **4/28/11**, Department of Chemical Engineering, University of California, Santa Barbara, CA.
125. "Polymer Hydroxide Exchange Membranes: Fuel Cells, Energy Storage, and Solar Hydrogen", **7/2/11**, 6th Sino-US Nano Forum, Jilin University, Changchun, China.
126. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **7/8/11 (Distinguished Alumni Lecturer)**, Dalian Institute of Chemical Physics, Chinese Academy of Sciences
127. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **7/11/11**, School of Automotive Studies, Tongji University, Shanghai, China
128. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **10/6/11**, Center for Catalytic Science and Technology, Annual Review, University of Delaware, Newark, DE
129. "Fuel cells, energy storage, and solar hydrogen: Toward a clean safe and sustainable energy future", **10/26/11**, Department of Chemical Engineering, Lehigh University, Bethlehem, PA
130. "Hydroxide exchange membranes: Fuel cells, energy storage, and solar hydrogen", **11/9/11**, The 6th Sino-US Chemical Engineering Conference , Beijing, China
131. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/10/11**, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, China
132. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/10/11**, School of Chemical Engineering, Beijing University of Chemical Technology, Beijing, China
133. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/11/11**, Department of Chemical Engineering, Tianjin University, Tianjin, China
134. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **11/14/11**, Department of Chemistry, Northeastern University, Shenyang, China
135. "Fuel cells, energy storage, and solar hydrogen: Toward a clean, safe and sustainable energy future", **12/5/11**, Department of Chemical Engineering, Stanford University, Palo Alto, CA
136. "Zeolite Thin Films: From Computer Chips to Space Station", **12/9/11**, Northeast Corridor Zeolite Association, University of Pennsylvania, Philadelphia, PA.
137. "Clean Energy: Flash without Flame", **3/7/12**, Distinguished Engineering Professor Inaugural Lecture, University of Delaware, Newark, DE
138. "Clean Energy: Flash without Flame", **3/29/12**, Daegu Gyeongbuk Institute of Science and Technology, Daegu, Korea
139. "Sustainable Energy: Flash without Flame", **4/15/12**, TEDxUD, Inaugural Meeting, University of Delaware, Newark, DE
140. "Clean Energy: Flash without Flame", **6/12/12**, University of Delaware Energy Institute

(UDEI) Annual Review, University of Delaware, Newark, DE

141. "Zeolite Thin Films for Water and Energy Applications", **8/1/12** (**Keynote Lecture**), ZMPC 2012, Hiroshima, Japan
142. "Hydroxide Exchange Membranes for Energy Conversion and Storage", **8/22/2012**, The 1st International Symposium on Polymer Ecomaterials (PEM2012), Changchun, China
143. "Hydroxide exchange membrane fuel cells", **10/18/2012**, University of Delaware Energy Institute Fuel Cell Workshop.
144. "Zeolite thin films and coatings", **11/14/2012**, ExxonMobil, Clinton, NJ
145. "Hydroxide exchange membranes: Fuel cells, solar hydrogen and flow batteries", **1/10/2013**, Tsinghua and UD Workshop on Energy and Environment, Tsinghua University, Shenzhen, China.
146. "Clean energy: Hydroxide exchange membrane fuel cells and flow batteries", **5/15/13**, UD Energy Institute Annual Review.
147. "Hydroxide Exchange Membrane Fuel Cells: New Membranes and Catalysts", **6/14/2-13**, Dalian Institute of Chemical Physics Symposium on Fuel Cells, Dalian, China.
148. "Adamantane-Centered 3D Covalent Organic Frameworks as Ultra-Low-*k* Materials", **6/18/2013**, 6th International Zeolite Membrane Meeting (IZMM 2013), Jeju Island, South Korea.
149. "Hydroxide Exchange Membranes: Fuel cells, electrolyzers, solar hydrogen, and flow battery", **7/25/13,** Anion-Exchange Membranes for Energy Generation Technologies Workshop, University of Surrey, Guilford, UK.
150. "Nonprecious Metal Catalysts for Fuel Cells, Electrolyzers, and Solar Hydrogen Generators", **9/9/13,** American Chemical Society Meeting, Indianapolis, Indiana.
151. "Clean Energy: Flash without Flame", **9/26/13**, Department of Chemical Engineering, University of Missouri.
152. "Hydroxide exchange membranes and zeolite membranes", **11/8/13**, Air Liquide, Newark, DE.
153. "Clean Energy: Flash without Flame", **11/19/13**, University of Science and Technology of China, Hefei, China
154. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **5/29/14,** Department of Applied Chemistry, Beijing University of Chemical Technology, Beijing, China.
155. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **6/4/14,** The 5th AEARU5 Advanced Materials Workshop, Hong Kong University of Science and Technology, Hong Kong, China.
156. "Hydroxide exchange membranes for electrochemical energy conversion and storage", **7/20/14 (Keynote Lecture),** The 10th International Congress on Membranes and Membrane Processes (ICOM2014), Suzhou, China.
157. "Hydroxide Exchange Membrane Fuel Cells: New Membranes and Catalysts", 7/24/14, Wuhan University, China.
158. "Catalysts for Hydroxide Exchange Membrane Fuel Cells", **7/28/14**, Department of Applied Chemistry, Beijing University of Chemical Technology, Beijing, China.
159. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis for fuel cells", **11/14/14**, Annual Review, Center for Catalytic Science and Technology, University of Delaware, Newark, DE.
160. "Covalent organic frameworks (COFs): From design to applications", **11/12/14,** ExxonMobil, Clinton, NJ.
161. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis for fuel cells", **11/12/14**, The Catalysis Society of New York, Summerset, New Jersey.
162. "Polymer Hydroxide Exchange Membranes for Electrochemical Energy Conversion and Storage", **11/17/14**, Membrane Research and Innovation Activities around the World,

American Institute of Chemical Engineers Annual Meeting, Atlanta, GA.

163. "Double Membrane Redox Flow Batteries for Economical and Efficient Renewable Electricity Storage", **11/17/14**, Inorganic Materials Plenary: Honorary Session for Prof. Michael Tsapatsis, American Institute of Chemical Engineers Annual Meeting, Atlanta, GA.
164. "Covalent organic frameworks (COFs): from design to applications", **12/15/14**, Northeast Corridor Zeolite Association, University of Pennsylvania, Philadelphia, PA.
165. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **1/13/15**, Chemical Engineering, Drexel, Philadelphia, PA.
166. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **3/5/15**, Chemical Engineering, Ohio State University, Columbus, OH.
167. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Non-precious metal hydrogen and oxygen evolution catalysts, **5/26/2015 (keynote),** The Electrochemical Chemical Society Meeting, Chicago, IL.
168. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **6/19/15**, Institute of Advanced Studies Lecture, Hong Kong University of Science and Technology, Hong Kong, China.
169. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **6/22/15**, SUSTC Chemical Science Lectureship, South University of Science and Technology of China, Shenzhen, China.
170. "Polymer hydroxide exchange membrane fuel cells: Electrocatalysis and polymer electrolytes", **6/23/15**, Department of Chemistry, Xiamen University, Xiamen, China.
171. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **6/25/15**, Ningbo Institute of Materials Technology and Engineering, Ningbo, China.
172. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **9/30/15**, Chemical Engineering, University at Buffalo, Buffalo, NY.
173. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **10/14/15 (Keynote Lecture)**, Sino-US Chemical Engineering Conference, Shanghai, China.
174. "Zeolite Thin Films: From Computer Chips to Space Station", **10/16/15**, Sinopec, Beijing, China.
175. "Covalent organic frameworks (COFs): From design to applications", **10/16/15**, Sinopec, Beijing, China.
176. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **10/20/15**, Energy Institute, Texas A&M University, College Station, TX.
177. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **10/21/15**, Chemical Engineering, University of Houston, Houston, TX.
178. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **10/26/15**, Nano Science, Arizona State University, Tempe, AZ.
179. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **1/22/16**, Fuel Cell Catalysis Workshop, Zhejiang University, Hangzhou, CHina.
180. "Organic covalent frameworks: From design to applications", **1/25/16,** Porous Materials Workshop, Jilin University, Zhuhai, China.
181. "Toward a Distributed Renewable Electrochemical Energy and Mobility System:

Electrocatalysis and polymer electrolytes for fuel cells", **3/30/16**, Department of Chemical Engineering, University of New Mexico, Albuquerque, NM.

182. "AMFC Challenges: Electrocatalysis", **4/1/16,** DOE AMFC Workshop, Phoenix, AZ.
183. "Electrocatalysis for hydroxide exchange membrane fuel cells, **5/30/16** (**Keynote Lecture**), ECS meeting, San Diego, CA.
184. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **7/21/16 (Plenary Lecture)**, Global Chinese Chemical Engineering Symposium, Singapore.
185. "Covalent organic frameworks and membranes", **8/20/16 (Keynote Lecture**), 7th International Zeolite Membrane Materials, Dalian, China
186. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **9/21/16**, Department of Chemistry, Nanjing University, Nanjing, China
187. "Platinum-free fuel cells for zero-emission cars", **9/25/16 (Plenary Lecture)**, 2016 International Forum on Advanced Materials, organized by the Chinese Academy of Sciences and Engineering, Nanjing, China
188. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis and polymer electrolytes for fuel cells", **9/29/16**, Department of Chemical Engineering, University of Oklahoma, Norman, Oklahoma
189. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis", **11/21/16 (Plenary Lecture)**, Nanoscale Science and Engineering Forum Award Lecture, American Institute of Chemical Engineers, San Francisco, CA
190. "Activity Targets for Nanostructured PGM-Free Catalysts in Hydroxide Exchange Membrane Fuel Cells", **12/7/2016**, Alkaline Membrane Fuel Cell: Catalysis and Materials, Wuhan University, Wuhan, China
191. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis", **1/24/2017**, Chemical Engineering, University of Waterloo, Waterloo, Canada
192. "Highly conductive, stable and robust hydroxide exchange membranes based on poly(aryl piperidinium)", **2/16/2017**, Polymers for Fuel Cells, Energy Storage, and Conversion, an ACS Polymer Division Workshop, Asilomar, CA
193. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis", **4/6/17**, Department of Electrical and Computer Engineering, University of Delaware, Newark, DE
194. "Toward a Distributed Renewable Electrochemical Energy and Mobility System: Electrocatalysis", **4/11/17**, Department of Chemical Engineering, Kansas State University, Manhattan, KS
195. "Artificial roots and the ammonia economy: Electrochemical ammonia synthesis and direct ammonia fuel cells", **5/22/2017,** RE^3Workshop 2017, University of Louisville, Louisville Kentucky
196. "Platinum-free fuel cells for affordable zero-emission cars", **9/19/2017**, Chemical Engineering, Oklahoma State University,
197. "Platinum-free fuel cells for affordable zero-emission cars", **10/12/2017**, Chemical Engineering, University of Virginia, Richmond, VA
198. "Platinum-free fuel cells for affordable zero-emission cars", **10/31/2017**, Electrochemistry Fundamentals Tutorial, AICHE Annual Meeting, Minneapolis, MN
199. "Polymer Electrolytes for Electrochemical Energy Devices", **11/1/2017,** Materials Science and Engineering Plenary, AICHE Annual Meeting, Minneapolis, MN
200. "Hydroxide Exchange Membrane Fuel Cells for Affordable Zero-Emission Cars", The 19th National Conference on Electrochemistry & ECS-CSE Joint Symposium on Electrochemistry of Energy & Environment, **12/4/2017,** Shanghai, China

201. "Platinum-free fuel cells for affordable zero-emission cars", **12/11/2017**, Institute of Chemistry, the Chinese Academy of Sciences, Beijing, China
202. "Platinum-free fuel cells for affordable zero-emission cars", **12/13/2017**, Department of Materials Science and Engineering, Peking University, Beijing China
203. "Platinum-free fuel cells for affordable zero-emission cars", **2/1/2018**, Department of Chemical Engineering, Iowa State University, Ames, Iowa
204. "Platinum-free fuel cells for affordable zero-emission cars", **4/27/2018**, **XINGDA LECTURE**, College of Chemistry and Molecular Engineering, Peking University, Beijing, China
205. "Hydroxide Exchange Membrane Fuel Cells for Affordable Zero-Emission Vehicles", **6/27/2018,** Plenary Lecture, DICP Symposium
206. ZMPC 2018, 8/8/18
207. Notre Dame, 9/25/2018
208. MIT, 3/8/2019
209. EPFL, 5/9/2019
210. SCUT, 7/17/2019
211. DICP, 8/19/2019
212. USTC, 8/22/2019
213. Penn, 10/23/2019
214. UCSB, 11/7/2019
215. U Pitts, 2/14/2020
216. Shell, 2/19/2020 (cancelled)
217. Wash U 4/10/2020 (cancelled)
218. NJIT 4/2020 (cancelled)