

Michael John Zaworotko

Bernal Chair of Crystal Engineering and Science Foundation of Ireland Research Professor
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Personal

Date of Birth: 14 August, 1956, Tredegar, South Wales
Citizenship: United Kingdom, Canada and USA

Education

1974 - 77 Imperial College, London, U.K., B.Sc. (Hons), ARCS
1978 - 82 University of Alabama, Ph.D. (supervisor: J.L. Atwood)

Professional Experience

1979 - 82 University of Alabama, Research Assistant (Biology Department)
1982 - 85 University of Victoria, Post-Doctoral Fellow (S.R. Stobart)
1985 - 97 Saint Mary's University, Assistant, Associate and Full Professor
1991 - 92 NRC Senior Research Associate (U.S.), USAF Academy
1994 - 97 Saint Mary's University, Chairperson, Department of Chemistry
1995 - 99 President, Diazans Limited
01/98 - 09/99 Dean of Arts and Science, University of Winnipeg
09/99 - 08/08 University of South Florida, Chair Dept. of Chemistry
08/08 - 10/13 University of South Florida, Professor of Chemistry
11/13-present University of Limerick, Bernal Chair of Crystal Engineering

Honors and Awards

Awarded President's Award for Research Excellence, Saint Mary's University, 1994
Appointed Visiting Professor, Universite Louis Pasteur, Strasbourg, 1999
Appointed Visiting Professor, Institute of Biology and Chemistry of Proteins, CNRS, Lyon, France, 2001
Appointed Conference Universitaire de Suisse Occidentale Lecturer, 2002 and 2005
Listed 20th highest citation impact chemist for work published between 2000 and 2010 by Thomson Reuters: <http://sciencewatch.com/dr/sci/misc/Top100Chemists2000-10/>
Elected Fellow of the American Association for the Advancement of Science, 2011 and appointed in 2012
Appointed Distinguished University Professor, University of South Florida, 2013
Appointed Distinguished Adjunct Professor, King Abdulaziz University, Jeddah, Saudi Arabia, 2014-2015
Listed as highly cited researcher by Thomson Reuters in 2014, 2015 and 2016: www.highlycited.com
Institute of Chemistry of Ireland, Eva Philbin Award, 2015
Admitted as Fellow of the Royal Society of Chemistry, 2015
Admitted as Fellow of the Institute of Chemistry of Ireland, 2015

Memberships in Professional Organizations

1982 - present	American Chemical Society
2011 - present	American Association for the Advancement of Science
2015 - present	Royal Society for Chemistry
2015 - present	Institute of Chemistry of Ireland

Research Grants Awarded

- 1986 "Organotransition Metal Sustained Liquid Clathrates." NSERC Operating - \$16,320 - one year.
"Liquid Clathrates - Utilization as Alkylating Agents NSERC Research Development - \$12,000/yr. - two years.
"Metal Superoxide Complexes" NSERC General - \$4,000 - one year
"Homogeneous Catalysis using Liquid Clathrates" Senate Research - \$1,500 and \$1,450 - 1 year.
SEED Summer Employment Subsidy - ca. \$2,800
- 1987 "Organotransition Metal Sustained Liquid Clathrates" NSERC Operating - \$16,320 - one year.
"Determination of the Alkylating Capabilities of Anionic Alkyl Aluminum Reagents"
Petroleum Research Fund (type B) - U.S. \$10,000/yr. - two years
"Room Temperature Ionic Liquids" NSERC General - \$2,500 - one year.
"Novel Applications of Liquid Clathrates" Senate Research - \$1,756 - one year.
SEED Summer Employment Subsidy - ca. \$1,500.
- 1988 "Salt Sustained Liquid-Liquid Binary Phases" NSERC Operating - \$10,000 - one year.
"Novel Approaches to Hydrocarbon Separation Problems" Imperial Oil Ltd. - \$10,000 - 1 year.
"Applications of Room Temperature Liquids" NSERC General - \$4,000 - one year.
"Applications of Ionic Liquids to Separation Problems" Senate Research - \$1,600 - one year.
SEED Summer Employment Subsidy - ca. \$2,000
- 1989 "Aspects of Arene Chemistry" NSERC Operating - \$25,844 per year for 3 years.
"Hydrocarbon Separation Properties of Molten Salts" Imperial Oil Ltd. (URG) - \$8,000 - 1 year.
"Novel Approaches to Lubricating Oil Processing" NSERC University/Industry with Imperial Oil - \$50,000 per year for 3 years.
- 1990 An internal grant of \$116,000 was awarded for purchase of and X-ray diffractometer
- 1991 "X-ray crystallographic work station" NSERC Equipment - \$25,193
- 1992 "Arenes: Covalent and Non-covalent Bonding" NSERC operating - \$26,810 per year for four years.
"Ionic Liquids" NSERC General - \$2,500
- 1993 "Crystal Engineering of Diamondoid Networks with Zeolite-Like Physical Features"
NSERC University/Industry with ICST - \$60,000 - 1 year.
- 1994 "Crystal Engineering of Microporous Polymeric Solids" ICST and NSERC - \$89,000/year - 2 years.
- 1995 "Novel Biologically Active Compounds" Contract from Shaw Group Ltd. - \$100,000 - 1 year
- 1995 "Crystal Engineering: The Design and Application of Functional Solids"
NATO ASI - \$80,000 (co-chair with K. Seddon)
- 1996 "Crystal Engineering of Functional Solids" NSERC - \$40,740 per year - 4 years
- 1996 "Low temperature device for single crystal X-ray diffractometer" NSERC Equipment - \$33,730.
- 1996 "Novel Biologically Active Compounds" Contract from Shaw Group Ltd. and IRAP - \$150,000 - 1 yr

Research Grants Awarded -- Continued

- 1996 "Guest Interactions in Crystal Engineered Host Frameworks"
NATO CRG - \$11,300 (with K. Seddon, R. Rogers)
- 1996 "Environmental Applications of Organic Clays" ESTAC and NSERC - \$38,300 - 1 year
- 1996 "CCD diffractometer" Internal Research Grant - \$240,000
- 1998 "Novel Technology for Hog Manure Remediation – \$35,000 – 1 year
Manitoba Livestock Manure Management Initiative
- 1998 "Environmental Applications of Organic Clays" – \$75,000 – 1 year
ESTAC/NSERC (with M. Lamoureux, Saint Mary's university)
- 2000 "Biocomposite Materials by Design" – \$20,000 – 1 year – Florida High
Technology Corridor (with D. Merkler, University of South Florida)
- 2000 "Characterization of Polymorphs of Fluocinolone Acetonide" - \$20,000 – 1 year
Bausch & Lomb Pharmaceuticals, Ltd., Tampa.
- 2001 "From Molecular Polygons to Discrete Faceted Polyhedra to Porous Frameworks" – \$445,219 –
04/15/01 thru 03/31/04 – National Science Foundation (Division of Materials 0101641).
- 2001 "Synthesis, X-ray Study and Inclusion Properties of the Crown Based Extended Networks" -
\$35,000 – 01/01/02 thru 04/30/03 – US Civilian Research and Development Foundation (with Y.
Simonov, Moldova, 20% of funds to M.Z.).
- 2001 "Intelligent Design of Pharmaceutical Solids" - \$40,000 – 06/01/02 thru 05/31/03 – Vahlteich
Research Fund (with N. Rodriguez, University of Michigan, 40% of funds to M.Z.).
- 2002 "Multi-Component Crystalline Pharmaceutical Phases" - \$35,000 – 01/01/03 thru 12/31/03–
Transform Pharmaceuticals
- 2003 "Integrated Interdisciplinary Nanoscience REU" – \$213,000 – 01/01/03-12/31/05 – National
Science Foundation (PI with co-PI's R. Walsh and P. Muisener and 7 faculty mentors).
- 2003 "Molecular Nanoscience Research at USF – NanomolUSF" - \$50,000 – 05/01/03-04/30/05 –
Interdisciplinary
Research Grant Program at USF (PI with co-PI's S. Hariharan and R. Schlaf)
- 2003 "Multi-Component Crystalline Pharmaceutical Phases" - \$320,000 – 08/26/03 thru 08/25/07–
Transform Pharmaceuticals
- 2003 "Novel Agricultural Chemical Formulations" - \$12,000 – 09/01/03 thru 08/31/04 – Florida High
Tech Corridor
- 2004 "Smart Porous Metal-Organic Frameworks (MOFs) for Hydrogen Recovery and Storage" -
\$200,000 – 01/01/05-12/31/05 – NASA (M. Eddaoudi PI, co-PI with B. Space, J. Eckert, A. Raissi, N.
Mohajeri)
- 2005 "Purchase of a High Resolution ESI-TOF Mass Spectrometer ", \$273,754 – 02/01/05-01/31/06 –
NSF-CRIF (PI and major user with six other chemistry faculty)
- 2006 "Smart Porous Metal-Organic Frameworks (MOFs) for Hydrogen Recovery and Storage" -
\$125,000 – 01/01/06-12/31/06 – NASA (M. Eddaoudi PI, co-PI with B. Space, J. Eckert, A. Raissi, N.
Mohajeri)
- 2006 "Design of pharmaceutical co-crystals", \$53,300 – 02/01/06-08/31/07 – Transform
Pharmaceuticals

Research Grants Awarded -- Continued

- 2007 "Novel Porous Metal Organic Frameworks (MOF) for Hydrogen Storage", \$882,000 – 08/15/07-08/14/10 – Department of Energy (M. Eddaoudi PI, co-PI with B. Space, J. Eckert, A. Raissi)
- 2008 "Functional Photocatalytic Materials for Threat Decontamination/Degradation" - \$2,400,000 – 07/10/08-07/09/12 – Department of Defense (R. Larsen PI, M. Zaworotko is co-PI with M. Eddaoudi, J. Harmon and P. Zhang)
- 2008 "Pharmaceutical Co-Crystals for Alzheimer's Disease Therapy: Improving Clinical Properties Through Crystal Engineering" – \$59,786 –07/01/08-06/30/09 - Byrd Alzheimer's Institute (M. Zaworotko PI, T. Gauthier co-PI)
- 2009 "Hydrogen Storage Materials with Binding Intermediate between Physisorption and Chemisorption" - \$55,000- 08/17/09-08/16/10 – Department of Energy (PI of sub-contract from University of California, Santa Barbara).
- 2010 "KAUST-USF Metal-Organic Materials Network: Smart Materials for Energy and Environmental Sustainability" – \$1,003,505 – 09/20/10-09/19/13 – KAUST Faculty Initiated Collaboration – (M. Zaworotko is PI with co-PI's B. Space, P. Zhang and J. Eckert).
- 2011 "Design, synthesis and properties of calixarene based metal organic materials, calix-MOMs" – \$88,000 - 11/01/11-10/31/13 - CRDF Global CGP 2010/2011 Climate Change & Energy (with Institute of Organic Chemistry, National Academy of Sciences of Ukraine, Zaworotko is USF PI)
- 2011 "Electric Powered Adsorption Heat Pump for Electric Vehicles" - \$200,000 – 12/01/11-11/30/2013 - Department of Energy ARPA-E HEATS (with Pacific Northwest Laboratory (Zaworotko is USF PI with co-PI Shengqian Ma).
- 2013 "Crystal Engineering of Task-Specific Materials" - € 5,000,000 - 11/01/13 - 10/31/18 - Science Foundation of Ireland Research Professor Programme.
- 2016 "Solid-State Ionic Cocrystal Complexes" - € 40,000 – 06/01/16 - 08/31/16 – Syngenta.
- 2016 "Advanced Sensor Development" - € 35,000 – 09/01/16 - 08/31/17 – Analog Devices.

Invited Seminars

- 1987
 - . Mount Allison University
 - . CANMET, Ottawa
 - . Imperial Oil Limited, Sarnia
 - . University of Waterloo
 - . Dalhousie University
- 1988
 - . Acadia University
 - . University of South Alabama
 - . University of Alabama
- 1989
 - . Northern Illinois University
 - . Brown University
- 1990
 - . University of Saskatchewan
 - . Dalhousie University
- 1992
 - . Imperial Oil Limited, Sarnia
 - . CANMET, Ottawa
 - . University of Alabama
 - . University of Mississippi
 - . Wright Laboratory, Dayton, Ohio
 - . Memorial University of Newfoundland*
- 1993
 - . Dalhousie University*
 - . University of New Brunswick*
 - . Universite Moncton*
 - . University of Prince Edward Island*
 - . Mount Allison University*
 - . University of Guelph
 - . University of Groningen
 - . University of Alabama
- 1994
 - . Acadia University
 - . University of Northern British Columbia
 - . Exxon Research and Engineering, N.J.
- 1995
 - . ETH Zurich
 - . The Queen's University of Belfast
 - . The University of Birmingham
 - . The University of Western Ontario
 - . The University of Windsor
 - . Brown University
- 1996
 - . Brown University
 - . Northern Illinois University
 - . National Research Council, Ottawa
 - . Trinity College, Dublin, Ireland
- 1997
 - . The University of Waterloo
 - . CNRS, Lyon, France

Invited Seminars -- Continued

- 1997
 - . University of Siegen, Germany
 - . Saint Mary's University
- 1998
 - . The University of Winnipeg
 - . The University of Manitoba
 - . Sumi State University
 - . Institute of Physics of Ukraine
 - . Kyiv State University
 - . Trojan Technologies, London, Ontario
 - . Nortran Pharmaceuticals, Vancouver
 - . Apotex, Winnipeg
 - . The University of Missouri, Columbia
 - . The University of Manitoba (Physics)
- 1999
 - . Seoul National University, Korea
 - . POSTECH, Pohang, Korea
 - . University of South Florida
 - . Universite Louis Pasteur, Strasbourg, France
 - . Eastman Chemical, US
 - . Bell Labs
 - . University of Windsor, Canada
 - . Constellation Technologies, Florida
- 2000
 - . Memorial University of Newfoundland, Canada
 - . Acadia University, Canada
 - . Mount Allison University, Canada
 - . Saint Mary's University, Canada
 - . University of Miami
 - . University of Florida
 - . Clemson University
 - . University of Alabama
 - . University of Mississippi
 - . University of South Carolina
 - . University of Prince Edward Island, Canada
 - . Saint Francis Xavier University, Canada
- 2001
 - . University of Michigan
 - . Universite Claude Bernard, Lyon, France
 - . University of Winnipeg, Canada
- 2002
 - . University of South Florida, College of Medicine
 - . University of Iowa
 - . University of North Carolina
 - . Worcester Polytechnic Institute
 - . Transform Pharmaceuticals
 - . University of Durham, England
 - . University of Geneva, Switzerland

Invited Seminars -- Continued

- 2002
 - . University of Neuchatel, Switzerland
 - . University of Fribourg, Switzerland
 - . University of Bern, Switzerland
 - . University of Winnipeg, Canada
 - . University of Brandon, Canada
- 2003
 - . World Precision Instruments, Sarasota
 - . University of South Florida, Complex Systems Seminar Series
 - . University of Manitoba
 - . University of Prince Edward Island
 - . Mount Allison University
 - . Saint Mary's University
- 2004
 - . Georgetown University
 - . Institute for Chemical and Engineering Sciences, Singapore
 - . Pfizer Global Research, Groton, CT
 - . Institut de Biologie et Chimie des Proteines, Lyon, France
 - . Acadia University
 - . St. Mary's University
 - . Amgen, Thousand Oaks, California
- 2005
 - . Davidson College, NC
 - . University of Houston
 - . Amgen, Cambridge, Massachusetts
 - . Johnson & Johnson Pharma R&D, Raritan, NJ
 - . University of Notre Dame
 - . University of Basel
 - . University of Geneva
 - . University of Bern
 - . University of Lausanne
 - . University of Notre Dame
- 2006
 - . University of Texas, San Antonio
 - . University of Cape Town
 - . University of Stellenbosch. S. Africa
 - . AstraZeneca, Macclesfield, UK
 - . Novartis, E. Hanover, New Jersey
- 2007
 - . Florida International University
- 2008
 - . Acadia University, Canada
- 2009
 - . Saint Mary's University, Canada
 - . Sun Yat-Sen University, China
 - . National Taiwan University, Taipei, Taiwan
 - . Academia Sinica, Taiwan
 - . National Chung Cheng University, Taiwan
- 2010
 - . National University of Morelos, Cuernvaca, Mexico
 - . Northwestern University

Invited Seminars -- Continued

- 2010
 - . Tulane University Medical School, Peptide Research Group
 - . Mutual Pharma, Philadelphia
 - . Cephalon, Frazer, PA
 - . College of New Jersey, Ewing, NJ
 - . Nanjing University, China
 - . Southeast University, China
- 2011
 - . National Chemical Laboratory, Pune, India
 - . Dr. Reddy's, Hyderabad, India
 - . University of Hyderabad, India
 - . Nankai University, China
 - . Texas A&M University
 - . University of Michigan
 - . University of West Florida
- 2010
 - . Northwest University, X'ian, China
 - . Luoyang Normal University, Luoyang, China
- 2011
 - . Indian Institute of Technology, Kharagpur, India
 - . Indian Association for the Cultivation of Science, Kolkata, India
 - . Indian Institute of Science Education and Research, Kolkata, India
 - . Technical University of Delft, The Netherlands
 - . Solvias AG, Basel, Switzerland
- 2012
 - . University of Milan Bicocca, Italy
 - . Alkermes, Inc., Waltham, MA, USA
 - . National University of Singapore
 - . Institute of Chemical and Engineering Sciences, Singapore
 - . Saint Francis Xavier University, Canada
 - . Saint Mary's University, Canada
 - . East China Normal University, Shanghai
- 2013
 - . Pacific Northwest National Laboratory
 - . University of Malaya
 - . Tianjin Normal University
 - . Tianjin University of Technology
 - . Nankai University
 - . Bohai University
- 2014
 - . University College Cork, Ireland
 - . Jiangnan University, China
 - . Nanyang Technological University, Singapore
 - . Alkermes, Inc., USA
 - . Cinvestav, Mexico City
 - . University of Windsor, Canada
 - . University of Nottingham, UK
 - . Queen's University, Belfast, UK

Invited Seminars -- Continued

- 2015
- . King Abdulaziz University, Saudi Arabia
 - . Herriot Watt University, Scotland
 - . Cardiff University, Wales
 - . Universidade Federal do Ceara, Fortaleza, Brasil
 - . Universidade Sao Paulo, Sao Carlos, Brasil
 - . McGill University, Canada
 - . Moderna Therapeutics, Boston, USA
 - . Saint Mary's University, Canada
- 2016
- . National University of Ireland, Galway
 - . Syngenta, Jealott's Hill, UK
 - . Nankai University (New campus)
 - . Shanghai Jiao Tong University
 - . Nankai University (Old campus)
 - . National Chemical Laboratory, Pune, India
 - . University of Jyväskylä, Finland
 - . Dalian University of Technology, China
 - . F. Hoffmann-La Roche, Basel, Switzerland

Synergistic Activities

- Industrial interaction since 1998. Funded research with the following companies: Bausch and Lomb Pharma; Constellation Tech.; Breed Technologies; Transform Pharma; United Agricultural Services.
- Have served as scientific consultant for several innovative pharmaceutical companies.
- Have served as legal consultant in >25 cases since 2006.
- Organizer of 17 symposia or conferences in U.S./Canada.
- 1999-present, Member of UTEK Corporation's Scientific Advisory Council; 2003-2007, Member of Transform Pharmaceutical's Scientific Advisory Board; 2007-2010, Member of Thar Pharmaceuticals Scientific Advisory Board; 2012 – present, Member of Alkermes, Inc., Scientific Advisory Board; 2016-present, Member of MOF Technologies Scientific Advisory Board.
- Founding Editor of *Crystal Engineering*, published by Elsevier from 1997-2003; Editorial Board *J. Chemical Crystallography*, *Crystal Growth & Design*, *International Union of Crystallography Journal*; International Advisory Committee: VIII International Seminar on Inclusion Compounds 2002, Singapore Int. Chemistry Conference 2005.
- Associate Editor of *Crystal Growth & Design*, published by the ACS, July 2006-present.
- Papers reviewed for many journals including *Science*, *Nature*, *JACS*, *Angewandte Chemie* in 2013/14.
- Invited participant in: *Challenges for the Chemical Sciences in the 21st Century* workshop organized by NRC, 2002; *Critical Building Blocks and Tools for Sustainability in the Chemical Industry: Identifying an Agenda for National Research* National Academy of Sciences, 2005.
- Served on panels for Canadian Foundation for Innovation and NSF/EPSCOR in 2003, MRSEC preproposal committee for NSF (2004), Canadian Foundation for Innovation in 2006 and 2009, Canada Research Chairs Program (2008) AAAS Materials for Energy Applications Panel (2010), NSF CAREER Awards Panel (2010), External Advisory Board for NYU-Xavier PREM (2011), Science Foundation of Ireland (2012), NSERC Canada Grant Selection Panel (2012-2015), NSF DMR "MOF panel" (2013).
- Cover art for *Crystal Growth & Design* (2004), *Chemical Communications* (2001 and 2004), *Chemical Reviews* (2001).
- External Reviewer for the Following Theses: M.S. (Memorial University, 1990; University of Cape Town, 1996). Ph.D. (Saskatchewan, Canada, 1990; Alabama, 1993, Waterloo, Canada, 1997; Chinese University of Hong Kong, 1999; University of Windsor, Canada, 1999; University of Hyderabad, 2003; University of Pune, India, 2008; IIT Guwahati, India, 2009; Technical University of Delft, Netherlands, 2011; University of Windsor, Canada, 2014; USP Sao Carlos, Brasil, 2015).
- Served as external reviewer of the chemistry program at Lebanese American University (2009).

Zaworotko Group Members (October 2016)

8 Ph.D. students as sole supervisor (Shiyuan Zhang, Daniel O'Nolan, Amrit Kumar, Peraka Krishna, Rana Sanii, Mohana Shivana, Imran Syed, Shiqiang Wang); 2 Ph.D. students as joint supervisor (M. Mulcair with T. Syed, Sarah Foley with Kevin Ryan); 9 post-doctoral fellows (Miranda Perry, John Perry, Hayley Scott, Matteo Lusi, Alankriti Bajpai, Kai Jie Chen, Qing-Yuan Yang, David Madden, Carol Hua); 1 visiting student (J. Fonseca).

Administrative Experience

09/94-12/97: Chair, Department of Chemistry, Saint Mary's University.

Highlights: Academic leadership of Department at a time of faculty renewal and growth in majors and external funding.

01/98-09/99: Dean of Arts and Science, University of Winnipeg.

Highlights: Administrative leadership for 90% of faculty and programs at University of Winnipeg, responsible for strategic resource allocation within College of Arts and Science.

09/99-08/08: Chair, Department of Chemistry, University of South Florida.

Highlights: Accountable officer for a Department in one of the 10 largest universities in the U.S. (currently >47,000 students). Department currently graduates ca. 300 majors per year, serves >130 graduate students and has 27 tenure track faculty and 16 permanent staff. Developed a 5-year plan that resulted in the hire of 11 new faculty between 2000 and 2009. Departmental research grants now ca. \$5,000K/year (up from ca. \$400K/year in 1999). Responsible for fund raising and external relations.

Evidence of Impact

Evidence that our research has achieved impact is suggested by the quality of the journals in which we have published and the following, all of which have occurred since 1999:

- Listed 20th highest citation impact chemist for work published between 2000 and 2010 by Thomson Reuters on 02/10/11: <http://sciencewatch.com/dr/sci/misc/Top100Chemists2000-10/>
- Listed as highly cited researcher in Chemistry (out of 198 worldwide) by Thomson Reuters in 2014, 2015 and 2016: www.highlycited.com
- Invited lectures (including multiple plenary and keynote lectures) at 110+ regional, national or international meetings from 2001 thru the present.
- Invited seminars at 60+ universities (US, Canada, UK, France, Switzerland, China, Ireland, Taiwan, India, The Netherlands) and 9 companies from 2006 thru the present.
- Over 32000 citations including >14000 since January 2011 (*Google Scholar*).
- A 2001 review article was determined by ISI to be the #1 hot paper in Chemistry in July 2003 and in October 2007 was recognized by ACS as a highly cited paper: http://pubs.acs.org/journals/chreay/promo/most/highly_cited/2007/oct.html
- 2001, 2005 and 2011 hot papers in *Angewandte Chemie*.
- 9 publications with >500 citations, 21 publications with >300 citations, 73 publications with >100 citations.
- Featured in a *C&E News* articles on metal-organic materials (09/15/03), polymorphism in drugs (11/21/05) and pharmaceutical co-crystals (18/07/07).
- Featured twice as an Editor's Choice in *Science* (May 18th 2001, vol. 292, pg. 1293), *Science*, 317, 1149, 2007.
- Featured in a *Nature Materials* News and Views article (October 2002, vol. 1, pgs. 91-92).
- Two patents licensed including one worth 6 figures that was granted in 2006.
- All of my former graduate students are professionally employed in industry or academia including 9 of my former mentees now employed by pharmaceutical companies (Catalent, Aptuit, Johnson & Johnson, ICES Singapore, Pfizer, Thar Pharma, Sepracor, Xcelience, Dr. Reddy's).

Evidence of Impact -- Continued

- Three of my former students are now faculty members who were awarded NSF CAREER Awards (Dr. Len MacGillivray, Iowa; Dr. K. Travis Holman, Georgetown, Dr. Z. Wang, South Dakota); Five more of my former graduate students are now tenured or tenure-track faculty members (Dr. G. McManus, Florida Gulf Coast; Dr. H. Abourahma, College of New Jersey; Dr. Z. Wang, South Dakota; Dr. Z. Zhang, Nankai; Dr. A. Schoedel, Florida Institute of Technology).
- Cover art for *Crystal Growth & Design* (2004, 2015), *Chemical Communications* (2001, 2004, 2015 x 2), *Chemical Reviews* (2001) and *Chemical Society Reviews* (2009).
- > \$14 million in external funding (either as PI or co-PI) since 2000.
- Associate editor of *Crystal Growth & Design*, published by the American Chemical Society.
- H-index of 82.

PUBLICATIONS

Papers

C = Communication; F = Full Paper; N = Note; L = Letter; Senior Author is underlined.

1. (C) Guzman, C.E.; Wilkinson, G.; Atwood, J.L.; Rogers, R.D.; Hunter, W.E.; Zaworotko, M.J. "Synthesis and Crystal Structures of Chloro(trimethylphosphine)tris(trimethylsilylmethyl)molybdenum(IV) and Di- μ -chloro-bis[bis(carbonyl)tri-methylphosphine(1-2- η -trimethylsilylmethyl-carbonyl)molybdenum (II)]." *J. Chem. Soc., Chem. Comm.*, 465, 1978.
2. (F) Shakir, R.; Zaworotko, M.J.; Atwood, J.L. "The Crystal and Molecular Structure of $K[Al_2(CH_3)_6SCN]$, a Compound which Contains an S,N-bridging Thiocyanate Ligand." *J. Organomet. Chem.*, 171, 9, 1979.
3. (F) Shakir, R.; Zaworotko, M.J.; Atwood, J.L. "Crystal and Molecular Structure of Cesium Isothiocyanatotrimethylaluminate." *J. Cryst. Mol. Struct.*, 9, 135, 1979.
4. (F) Zaworotko, M.J.; Atwood, J.L.; Floch, L. "Crystal and Molecular Structure of 5-amino-1,2,3,4-thiatriazole." *J. Cryst. Mol. Struct.*, 9, 2173, 1979.
5. (F) Zaworotko, M.J.; Atwood, J.L. "Crystal and Molecular Structure of $Cl_2AlN(C_2H_4N(CH_3)_2)$." *Inorg. Chem.*, 19, 268, 1980.
6. (C) Cetinkaya, B.; Hitchcock, P.B.; Lappert, M.F.; Torroni, S.; Atwood, J.L.; Hunter, W.E.; Zaworotko, M.J. "Transition-metal Complexes of Two Valence Tautomers of a Bulky Phenoxide, 2,6-Bu- t_2 -4-MeC₆H₂O- (ArO-); Preparation and Crystal and Molecular Structure of a Phenoxytitanium (III) and a Cyclohexadienonyl Rhodium(I) Complex, $[Ti(\eta^5C_5H_5O_2)OAr]$ and $[Rh(ArO^5)(PPh_3)_2]$." *J. Organomet. Chem.*, 188, C31, 1980.
7. (F) Rausch, M.D.; Hart, W.P.; Atwood, J.L.; Zaworotko, M.J.; "The Formation and Molecular Structure of (η^5 -nitrocyclopentadienyl) dicarbonyl rhodium." *J. Organomet. Chem.*, 197, 225, 1980.
8. (F) Guzman, E.C.; Wilkinson, G.; Rogers, R.D.; Hunter, W.E.; Zaworotko, M.J.; Atwood, J.L. "Synthesis and Crystal Structures of Chloro (trimethylphosphine) tris(trimethylphosphine)(1-2-trimethylsilylmethyl-carbonyl)molybdenum (II)." *J. Chem. Soc. Dalton Trans.*, 229, 1980.
9. (C) Lappert, M.F.; Slade, M.J.; Atwood, J.L.; Zaworotko, M.J. "Monomeric Coloured Germanium (II) and Tin (II) Di-*t*-butylamides, and the Crystal and Molecular Structure of $Ge(NCMe_2[CH_2]_3CMe_2)_2$." *J. Chem. Soc., Chem. Comm.*, 621, 1980.

Papers -- Continued

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46. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of Functional Solids". Erice School on Crystallography/ NATO-ASI, May 1999, Erice, Italy.
47. Zaworotko, M.J. **Invited Lecture**, "Zeolite and Clay Mimics: Design Strategies for Generation of Organic and Metal-Organic Adsorbents". Gordon Conference on Zeolites and Layered Materials, June 1999.
48. Zaworotko, M.J. **Invited Lecture**, "From Molecules to Crystals". Fourth International Conference on Materials Chemistry, Dublin, Ireland, July 1999.
49. Zaworotko, M.J. **Invited Lecture**, "From Achiral Building Blocks to Chiral Architectures", 18th Congress and General Assembly of the International Union of Crystallography, Glasgow, August 1999.

Conference Presentations (excluding presentations by co-workers) – Cont'd

50. Zaworotko, M.J. **Invited Lecture**, "Novel Technology for Hog Manure Odour Control/Remediation". HEMS annual symposium, Ottawa, Canada, December 1999.
51. Zaworotko, M.J. "From Molecules to Crystals: Crystal Engineering and its Implication for Synthetic Chemistry", 17th Annual Florida Organic Chemistry Faculty Conference, Tampa, Florida, February 2000.
52. Zaworotko, M.J. **Invited Lecture**, "From Molecules to Crystals ... and Back Again". 10th Annual Meeting of the Association for Crystallization Technology, New Brunswick, New Jersey, April 2000.
53. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of Zeolite and Clay Mimics". 83rd Canadian Society for Chemistry Conference, Calgary, Alberta, May 2000.
54. Zaworotko, M.J. "From Molecules to Crystals... and Back Again". 13th International Symposium on Surfactants in Solution, Gainesville, Florida, June 2000.
55. Zaworotko, M.J. **Invited Lecture**, "Design and Function of 2D and 3D Coordination Polymers". Royal Society of Chemistry, Dalton Discussion on Inorganic Crystal Engineering, Bologna, Italy, September 2000.
56. Zaworotko, M.J. **Keynote Lecture**, "From Molecules to Crystals...and Back Again." 1st International Workshop on Physical Characterization of Pharmaceutical Solids, Lancaster, PA, September 2000.
57. Zaworotko, M.J. **Invited Lecture**, "Coexisting Covalent and Noncovalent Nets". 35th ACS Midwest Regional Meeting, St. Louis, Missouri, October 2000.
58. Zaworotko, M.J. **Invited Lecture**, "Supramolecular Synthesis of Crystals". 35th ACS Midwest Regional Meeting, St. Louis, Missouri, October 2000.
59. Zaworotko, M.J. **Invited Lecture**, "Coexisting Covalent and Noncovalent Nets". ACS SW/SE Regional Meeting, New Orleans, Louisiana, December 2000.
60. Zaworotko, M.J. **Invited Lecture**, "Composite Materials by Design". Pacifichem 2000, Hawaii, December 2000.
61. Zaworotko, M.J. **Invited Lecture**, "Self-assembly of Discrete and Infinite Nanoscale Structures". AMRI-DARPA, New Orleans, February 2001.
62. Zaworotko, M.J. **Invited Lecture**, "Self-assembly of Discrete and Infinite Nanoscale Structures". XV International School-Seminar Spectroscopy of Molecular and Crystals, Chernihiv, Ukraine, June 2001.
63. Zaworotko, M.J. **Invited Lecture**, "Crystals and Nanocrystals by Design". ECM 20, "Supramolecular Materials Microsymposium", Krakow, Poland, August 2001.
64. Zaworotko, M.J. **Invited Lecture**, VIII International Seminar on Inclusion Compounds, Poland, September 2001.
65. Zaworotko, M.J. **Invited Lecture**, International Symposium on Crystal Chemistry, Chisinau, Moldova, October 2001.
66. Zaworotko, M.J. **Invited Lecture**, "From Molecules to Crystals: Crystal Engineering of Network Solids", 59th Pittsburgh Diffraction Conference, Cincinnati, October 2001.
67. Zaworotko, M.J. **Invited Lecture**, Modern Trends in Inorganic Chemistry, Calcutta, India, December 2001 (cancelled because of 9/11 related issues).
68. Zaworotko, M.J. **Invited Lecture**, Singapore International Chemical Conference, Singapore, December 2001 (cancelled because of 9/11 related issues).

Conference Presentations (excluding presentations by co-workers) – Cont'd

69. Zaworotko, M.J. **Invited Keynote Lecture**, Research Trends in Science and Technology 2002, Beirut and Byblos, Lebanon, March 2002.
70. Zaworotko, M.J. **Invited Lecture**, "Finite and Infinite Polygonal Assemblies", 223rd American Chemical Society National Meeting, Orlando, April 2002.
71. Zaworotko, M.J. **Invited Lecture**, "Binary Crystals by Design", 223rd American Chemical Society National Meeting, Orlando, April 2002.
72. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering with Pharmaceuticals: Design of the Composition and Structure of Pharmaceutical Phases", Higuchi Research Seminar, Kansas, May 2002.
73. Zaworotko, M.J. **Invited Lecture**, "Self-assembly of Crystals and Nanocrystals", American Crystallographic Association, San Antonio, May 2002.
74. Zaworotko, M.J. **Invited Lecture**, "Self-assembly of Crystals and Molecules with Nanoscale Features". 85th Canadian Society for Chemistry Conference, Vancouver, British Columbia, June 2002.
75. Zaworotko, M.J. **Invited Microsymposium Lecture**, 19th Congress and General Assembly of the International Union of Crystallography, Geneva, Switzerland, August 2002.
76. Zaworotko, M.J. **Invited Lecture**, SE Region ACS, Charleston, November 2002.
77. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of the Composition of Pharmaceutical Phases", ACS Prospective on Polymorphism in Crystals, Tampa, February 2003.
78. Zaworotko, M.J. "Crystal Engineering of the Composition of Pharmaceutical Solids", 225th ACS National Meeting, New Orleans, March 2003.
79. Zaworotko, M.J.; Moulton, B.; Lu, J.; McManus, G.; Wong, R.; Rather, B. **Invited Lecture**, "Crystal Engineering of Coordination Compounds with Nanoscale Features", FAME 2003, Orlando, May 2003.
80. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of the Composition of Pharmaceutical Phases", Strategies for Improving Solubility Workshop, Philadelphia, June 2003.
81. Zaworotko, M.J. **Invited Lecture**, "From Crystal Engineering of Coordination Polymers to Design of Nanoscale Molecules", 39th IUPAC Congress, Ottawa, Canada, August 2003.
82. Zaworotko, M.J. **Invited Lecture**, "Coordination Polymers with Nanoscale Features", 39th IUPAC Congress, Ottawa, Canada, August 2003.
83. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of the Composition of Pharmaceutical Phases", 39th IUPAC Congress, Ottawa, Canada, August 2003.
84. Zaworotko, M.J. **Invited Lecture**. "Crystal Engineering of the Composition of Pharmaceutical Phases", Strategies for Improving Solubility Workshop, Brussels, Belgium Oct. 2003.
85. Zaworotko, M.J. **Invited Lecture**. "Self-Assembly of Nanoscale Chemical Structures", ICMAT, Singapore, Dec. 2003.
86. Zaworotko, M.J. **Invited Lecture**. "Crystal Engineering of the Composition of API's", Determining Factors for Measuring Permeability Workshop, Philadelphia, January 2004.
87. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of the Composition of Pharmaceutical Phases", ACS Prospective on Polymorphism in Crystals, Tampa, February 2004.
88. Zaworotko, M.J. **Invited Lecture**. "Crystal Engineering of the Composition of API's", "Polymorphism and Crystallization Forum 2004, Princeton, April 2004.

Conference Presentations (excluding presentations by co-workers) – Cont'd

89. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Coordination Compounds with Nanoscale Features", 80th FAME 2004, Orlando, May 2004.
90. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of the Composition of Pharmaceutical Phases", Solubility Workshop, Philadelphia, June 2004.
91. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of the Composition of API's", Polymorphism Workshop, Philadelphia, June 2004.
92. Zaworotko, M.J. **Invited Lecture.** "Supramolecular Synthesis", Green Chemistry Gordon Conference, July 2004.
93. Zaworotko, M.J. **Invited Lecture.** "Do Pharmaceutical Co-crystals Represent a Path to Improved Medicines", Strategies for Improving Solubility Workshop, Brussels, Belgium Sep. 2004.
94. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of the Composition of API's", Polymorphism, Crystallization and Salt Selection Workshop, Washington, DC, February 2005.
95. Zaworotko, M.J. **Invited Lecture.** "Pharmaceutical Co-crystals – Do They Represent a New Path to Improved Medicines", Polymorphism and Crystallization 2005, London, UK, March 2005.
96. Zaworotko, M.J. **Invited Lecture.** "Pharmaceutical Co-crystals – Do They Represent a New Path to Improved Medicines", American Crystallographic Association Annual Meeting, Orlando, May 2005.
97. Zaworotko, M.J. **Invited Lecture.** "From Molecules to Crystals – and Back Again", American Crystallographic Association Annual Meeting, Orlando, May 2005.
98. Zaworotko, M.J. **Invited Lecture.** "The role of co-crystals in supramolecular and solid-state chemistry", 2nd International Conference on Green and Sustainable Chemistry and 9th Annual Green Chemistry and Engineering Conference, Washington DC, June 2005.
99. Zaworotko, M.J. **Invited Lecture.** "From Molecules to Crystals – and Back Again", Rare Earth Research Conference (RERC05), Keystone, Colorado, June 2005.
100. Zaworotko, M.J. **Invited Microsymposium Lecture**, Polymorphism in Co-crystals and Pharmaceutical Co-crystals", 20th Congress and General Assembly of the International Union of Crystallography, Florence, Italy, August 2005.
101. Zaworotko, M.J. **Invited Lecture.** "From molecular building blocks to binary and ternary nets", European Science Foundation meeting on "Supramolecular Chemistry: Molecular Architectures and Systems", Obernai, France, October 2005.
102. Zaworotko, M.J. **Keynote Lecture.** "From Molecules to Crystals... and Back Again", Singapore International Chemistry Conference IV, Singapore, December 2005.
103. Zaworotko, M.J. **Invited Lecture.** Pacifichem 2005, Honolulu, Hawaii, December 2005.
104. Zaworotko, M.J. **Invited Lecture.** "Realizing the potential of co-crystals as novel patentable materials", Developing IP strategies for crystalline forms conference, London, UK, December 2005.
105. Zaworotko, M.J. **Invited Lecture.** "Designing Pharmaceutical Co-crystals", Polymorphism and Crystallization 2006, London, UK, March 2006.
106. Zaworotko, M.J. **Invited Lecture.** "Design and preparation of co-crystals", ACS Prospective on Process Crystallization in the Pharmaceutical and Chemical Industry, Philadelphia, April 2006.
107. Zaworotko, M.J. **Invited Lecture.** "Do pharmaceutical co-crystals represent a new path to improved medicines?", FAME2006, Orlando, May 2006.
108. Zaworotko, M.J. **Invited Lecture.** "Crystal engineering of metal-organic nets with form and function", FAME2006, Orlando, May 2006.

Conference Presentations (excluding presentations by co-workers) – Cont'd

109. Zaworotko, M.J. **Invited Lecture.** "The Role of Co-crystals in Pharmaceutical Form and Formulation", Polymorphism and Crystallization 2006, IQPC Meeting, San Diego, May 2006.
110. Zaworotko, M.J. **Invited Lecture.** 89th Canadian Society for Chemistry Conference, Halifax, Nova Scotia, May 2006.
111. Zaworotko, M.J. **Invited Lecture.** "Design and preparation of co-crystals", INDABA5, Kruger National Park, South Africa, August 2006.
112. Zaworotko, M.J. **Invited Lecture.** "Pharmaceutical co-crystals: do they represent a new path to improved medicines?", British Pharmaceutical Conference, Manchester, UK, September 2006.
113. Zaworotko, M.J. **Invited Lecture.** "Polymorphism in co-crystals", Pharmaceutical co-crystals, IQPC Meeting, Amsterdam, September 2006.
114. Zaworotko, M.J. **Invited Lecture.** "The role of co-crystals in supramolecular and solid-state chemistry", XVth Conference on Physical Methods in Coordination and Supramolecular Chemistry, Chisinau, Moldova, September 2006.
115. Zaworotko, M.J. **Invited Lecture.** "Design and preparation of co-crystals", ACS Prospective on Crystallization Process Development: Case Studies & Research, Boston, February 2007.
116. Zaworotko, M.J. **Opening Plenary Lecture.** XIth International Seminar on Inclusion Compounds, Kyiv, Ukraine, June 2007.
117. Zaworotko, M.J. **Invited Lecture.** "Back to the future for metal-organic materials", Nano-Structured Porous Materials Workshop, DOD meeting, Washington DC, September 2007.
118. Zaworotko, M.J. **Invited Lecture.** "New Intellectual Property Opportunities for Old Natural Products via New Crystal Forms", Pharmaceutical Co-Crystals 2007, IQPC Meeting, Amsterdam, September 2007.
119. Zaworotko, M.J. **Invited Lecture.** SERMACS 2007, Greenville, SC, October 2007.
120. Zaworotko, M.J. **Plenary Lecture.** "Back to the future for metal-organic materials", 5th National Symposium on Structural Chemistry (5th NSSC), China and the Symposium on Chinese Strategy of Crystal Growth & Design, Fujian, China, October 2007.
121. Zaworotko, M.J. **Invited Lecture.** Polymorphism and Crystallization Conference, Clearwater, FL, November 2007.
122. Zaworotko, M.J. **Invited Lecture.** "Co-crystals by design: New opportunities for old natural products through crystal engineering." Polymorphism and Crystallization, Philadelphia, December 2007.
123. Zaworotko, M.J. **Invited Lecture.** "The role of co-crystals in pharmaceutical science", International Symposium on "Challenges and Innovations in Pharmaceutical Research" State University of Morelos, Cuernavaca, Mexico, March 2008.
124. Zaworotko, M.J. **Invited Lecture.** "Co-crystals involving chiral co-crystal formers", Polymorphism and Crystallization 2008, London, UK, March 2008.
125. Zaworotko, M.J. **Invited Lecture.** "Back to the future: new ligands for old topologies". 235th ACS National Meeting, New Orleans, LA, April 2008.
126. Zaworotko, M.J. **Invited Lecture.** "Increasing solubility by crystal engineering and co-crystal formation". 35th Annual Meeting & Exposition of the Controlled Release Society, New York, July 2008.
127. Zaworotko, M.J. **Invited Lecture.** "Pharmaceutical co-crystals." 236th ACS National Meeting, Philadelphia, PA, August 2008.

Conference Presentations (excluding presentations by co-workers) – Cont'd

128. Zaworotko, M.J. **Invited Keynote Lecture**. "The role of co-crystals in pharmaceutical science." 21st Congress and General Assembly of the International Union of Crystallography, Osaka, Japan, August 2008.
129. Zaworotko, M.J. **Keynote Speaker**. "New approaches to solvent-free synthesis: co-crystal controlled solid-state synthesis (C^3S^3)", British Pharmaceutical Congress, Manchester, September 2008.
130. Zaworotko, M.J. **Invited Lecture**. "The broader opportunities for co-crystals in drug discovery and development", Pharmaceutical Cocrystals 2008, Amsterdam, September 2008.
131. Zaworotko, M.J. **Invited Lecture**. "Pharmaceutical Co-crystals: History and Relevance to Drug Development", Drug Formulation 2008, Philadelphia, November 2008.
132. Zaworotko, M.J. "Crystal engineering strategies for improving the bioavailability of low solubility drugs", UK-US International Alzheimer's Disease Symposium, Tampa, November 2008.
133. Zaworotko, M.J. **Invited Lecture**, "The broader opportunities for co-crystals in drug discovery and development", Indo-US Bilateral Workshop on Cocrystals and Polymorphs, Mysore, India, February 2009.
134. Zaworotko, **Invited Lecture**, "From molecules to crystals, and back again", 38th National Seminar on Crystallography, Mysore, India, February 2009.
135. Zaworotko, M.J. **Invited Lecture**, "Pharmaceutical co-crystals – Do they represent multiple paths to new and improved medicines", Latin American Symposium on Polymorphism and Crystallization in Drugs and Medicines, Sao Pedro, Brazil, March 2009.
136. Zaworotko, M.J. **Plenary Lecture**, "From Molecules to Crystals and Back Again: Crystal Engineering of Functional Solids", Taibah International Chemistry Conference, Al Madinah, Saudi Arabia, March 2009.
137. Zaworotko, M.J. **Invited Lecture**, "The Role of Cocrystals in Pharmaceutical Science and Solid-State Chemistry", Molecules, Materials, Medicine, M³-2009, Santa Barbara, May 2009.
138. Zaworotko, M.J. **Three Invited Lectures**, 2009 Beijing Summer School on "Crystallography, Crystal Engineering and Functional Materials", Beijing, China, July 2009.
139. Zaworotko, M.J. **Invited Lecture**, "Achieving Greater Product Differentiation through Pre-Formulation Technologies", Product Enhancement Technologies in Pharmaceutical Life-Cycle Management, Philadelphia, September 2009.
140. Zaworotko, M.J. **Invited Lecture**, "Structure-Property Relationships in Multiple Component Crystals", Pharmaceutical Co-Crystals 2009, Amsterdam, September 2009.
141. Zaworotko, M.J. **Keynote Lecture**, "From molecules to crystals and metal-organic materials: What have we learned from the past 20 years?", 2nd Asian Conference on Coordination Chemistry, Nanjing, China, November 2009.
142. Zaworotko, M.J. **Invited Lecture**, "Making the right haystacks for the right needles: Metal-organic platforms from discrete metal-organic containers", 239th ACS National Meeting, San Francisco, CA, March 2010.
143. Zaworotko, M.J. **Invited Lecture**, "The role of co-crystals in green chemistry: Solvent-free synthesis of new ligands", FAME2010, Palm Harbor, Florida, May 2010.
144. Zaworotko, M.J. **Invited Lecture**, "Hierarchy of supramolecular synthons and their role in selection of cocrystal former libraries", 5th Bologna Convention on Crystal Forms, Bologna, Italy, September 2010.

Conference Presentations (excluding presentations by co-workers) – Cont'd

145. Zaworotko, M.J. **Invited Lecture**, "Advances in synthesis of pharmaceutical cocrystals", Association for Crystallization Technology 2010, Rutgers University, NJ, October 2010.
146. Zaworotko, M.J. **Invited Lecture**, "Pharmaceutical Cocrystals: A new path to improved medicines", 9th Polymorphism & Crystallization Scientific Forum, Philadelphia, October 2010.
147. Zaworotko, M.J. **Invited Lecture**, "New ligands for discrete and infinite metal-organic materials", Pacifichem 2010. Honolulu, Hawaii, December 2010.
148. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering: Where have we come from and where do we go next?", Current Trends in Crystal Engineering Research Symposium, Indian Institute of Science, Bangalore, India, December 2010.
149. Zaworotko, M.J. **Plenary Lecture**, "Form Before Function: Why Design Still Matters to Crystal Engineering", International Symposium on Facets of Weak Interactions in Chemistry, Kolkatta, India, January 2011.
150. Zaworotko, M.J. **Invited Lecture**, "Metal-organic material platforms for small molecule separations and ion exchange", 241st ACS National Meeting, Anaheim, CA, March 2011.
151. Zaworotko, M.J. **Invited Lecture**, Crystal engineering of properties in metal-organic and molecular solids", XXth International Conference on the Chemistry of the Organic Solid-State, Bangalore, India, June 2011.
152. Zaworotko, M.J. **Invited Lecture**, "Form before function: Why design still matters to crystal engineering", 242nd ACS National Meeting, Denver, CO, August 2011.
153. Zaworotko, M.J. **Invited Lecture**, "Form still comes before function: Why design still matters to crystal engineering", 13th International Seminar on Inclusion Compounds, Gierloz, Poland, September 2011.
154. Zaworotko, M.J. **Invited Lecture**, "Ensuring successful crystal engineering of multi-component crystals", Pharmaceutical Co-Crystals 2011, Amsterdam, September 2011.
155. Zaworotko, M.J. **Keynote Lecture**, "Crystal Engineering of Organic and Metal-Organic Materials", NanoFlorida 2011, Miami, FL, October 2011.
156. Zaworotko, M.J. **Invited Lecture**, "Form before function: Why design still matters to crystal engineering", Garnett E. Peck Symposium on Pharmaceutical Solids, Purdue University, October 2011.
157. Zaworotko, M.J. **Keynote Address**, "Form before function: Why design still matters to crystal engineering", 35th Senior Technical Meeting of the Puerto Rico Section of the American Chemical Society, Dorado, PR, November 2011.
158. Zaworotko, M.J. **Invited Lecture**, "Crystal engineering of multiple component crystalline solids", CF@Bo Meeting, Bologna, Italy, January 2012.
159. Zaworotko, M.J. **Invited Lecture**, "Crystal engineering of multi-component crystals: Why there is still room for design", Indo-US meeting on the Evolving Role of Solid-State Chemistry in Pharmaceutical Science, Manesar, near Delhi, India, February 2012.
160. Zaworotko, M.J. **Invited Lecture**, "Why crystal engineering means that there is still plenty of room at the bottom", KAUST Advanced Membranes and Porous Materials Center, Inaugural Symposium, March 2012.

Conference Presentations (excluding presentations by co-workers) – Cont'd

161. Zaworotko, M.J. **Invited Lecture**, "Selective gas adsorption of carbon dioxide by metal-organic material platforms", 243rd ACS National Meeting, San Diego, CA, March 2012.
162. Zaworotko, M.J. **Invited Lecture**, "Why topology matters to crystal engineers", Beautiful Crystals for the World – A Celebration of Michael O'Keeffe's Half a Century of Contributions to Symmetry and Patterns in Chemistry", Swanage, UK. May 2012.
163. Zaworotko, M.J. **Invited Lecture**, "The role of crystal engineering and cocrystals in pharmaceutical science", Symposium on Applications of Solid state Physics to Pharmaceuticals, Brazilian Physics Society, Aguas de Lindoia, Brasil, May 2012.
164. Zaworotko, M.J. **Invited Lecture**, "The crystal engineering approach to development of cocrystal former libraries", M3 - Molecular, Materials, Medicines, Banff, Canada May 2012.
165. Zaworotko, M.J. **Invited Lecture**, "Crystal engineering of multicomponent materials: Why there is still plenty of room at the very bottom", 244th ACS National Meeting, Philadelphia, Pennsylvania, August 2012.
166. Zaworotko, M.J. **Invited Lecture**, "How pore size control affects carbon dioxide uptake in porous materials", 244th ACS National Meeting, Philadelphia, Pennsylvania, August 2012.
167. Zaworotko, M.J. **Invited Lecture**, "Co-crystal former libraries and solubility enhancement", Pharmaceutical Co-Crystals 2012, Amsterdam, September 2012.
168. Zaworotko, M.J. **Keynote Lecture**, "Crystal engineering of task specific metal-organic materials", 6th National Symposium on Structural Chemistry, Suzhou, China, October 2012.
169. Zaworotko, M.J. **Invited Lecture**, "Smartly Designed Materials", Chemistry: Synthesis, Structure and Dynamics. A Conference on Crystal Engineering organized by the Indian Institute of Science and University of Hyderabad, Orange County Resort, Coorg, India, December 2012.
170. Zaworotko, M.J. **Invited Lecture**, "Product Diversity and Enhancement through Pre-Formulation Technologies with an Emphasis on Co-crystal Technology", 2nd Enhancing Drug bioavailability of Solubility Conference, Boston, MA, January 2013.
171. Zaworotko, M.J. **Invited Lecture**, "Catalytically active metal-organic materials", 245th ACS National Meeting, New Orleans, Louisiana, April 2013.
172. Zaworotko, M.J. **Invited Lecture**, "Metal-organic materials design in the context of carbon dioxide separations", 245th ACS National Meeting, New Orleans, Louisiana, April 2013.
173. Zaworotko, M.J. **Invited Lecture**, "Smart(ly Designed) Materials", Frontiers in Condensed Matter Sciences, Fortaleza, Brasil, April 2013.
174. Zaworotko, M.J. **Invited Lecture**, "Smart(ly Designed) Materials", Showcase symposium of FAME 2013, Innisbrook, Florida, May 2013.
175. Zaworotko, M.J. **Plenary Lecture**, "Smart(ly Designed) Materials", Past, Present and Future of Crystallography: From Small Molecules to Macromolecules and Supramolecular Structures, Milan, Italy, June 2013.
176. Zaworotko, M.J. **Invited Lecture**, "Smart(ly Designed) Materials", 7th CF@Bo Meeting, Bologna, Italy, June 2013.
176. Zaworotko, M.J. **Invited Lecture**, "Why Topology Matters to Crystal Engineers", SIAM Mathematical Aspects of Materials Science 2013, Philadelphia, June 2013.
177. Zaworotko, M.J. **Invited Lecture**, "Crystal Engineering of Task-Specific Porous Materials", ICMAT 2013, Singapore, July 2013.

Conference Presentations (excluding presentations by co-workers) – Cont'd

178. Zaworotko, M.J. **Plenary Lecture**, “Crystal engineering of porous material platforms”, Asian Crystallographic Association Meeting, Hong Kong, December 2013.
179. Zaworotko, M.J. **Invited Lecture**, “Crystal engineering of metal-organic material (MOM) platforms”, International Symposium on MOF and Related Open Framework Materials, Macao, December 2013.
180. Zaworotko, M.J. **Invited Lecture**, “Putting the squeeze on CO₂ with narrow pore metal-organic materials”, Symposium I, Materials for Carbon Capture, Materials Research Society, Spring Meeting, San Francisco, April 2014.
181. Zaworotko, M.J. **Invited Lecture**, “Multi-Component Pharmaceutical Materials”, 11th International Conference & Exhibition on Polymorphism and Crystallization, Orlando, FL, May 2014.
182. Zaworotko, M.J. **Invited Lecture**, “Crystal Engineering of Task-Specific Materials”, 1st International Symposium on Halogen Bonding, Porto Cesareo, Italy, June 2014.
183. Zaworotko, M.J. **Keynote Lecture**, “Crystal Engineering of Task-Specific Materials”, Materials and Surface Science Institute Annual Meeting, Limerick, June 2014.
184. Zaworotko, M.J. **Plenary Lecture**, “Crystal Engineering of porous metal-organic materials”, 13th International Symposium on Advancing the Chemical Sciences, Dublin, Ireland, July 2014.
185. Zaworotko, M.J. **Invited Lecture**, “Hybrid Organic-Inorganic Materials for Carbon Capture”, Metal-Organic Frameworks: Experiments and Simulations, Telluride Science Research Center, July 2014.
186. Zaworotko, M.J. **Plenary Speaker**, “Crystal Engineering of Task-Specific Materials”, University of Malaya Pharmaceutical Co-Crystal Symposium 2014, Kuala Lumpur, July 2014.
187. Zaworotko, M.J.; Schoedel, A. S.; Elsaidi, S. **Invited Lecture**. “Crystal engineering of new metal-organic material platforms”, 41st International Conference on Coordination Chemistry, Singapore, July 2014.
188. Zaworotko, M.J. **Invited Lecture**, “From crystal structures to crystal engineering – 102 years of x-ray diffraction and still going strong”. Boston Biotech Symposium 2014, Boston August 2014.
189. Zaworotko, M.J. **Invited Lecture**. “Crystal Engineering of Metal-Organic Platforms with Inorganic Anions”, 248th ACS National Meeting, San Francisco, California, August 2014.
190. Zaworotko, M.J. **Keynote Lecture**, “From crystal structures to crystal engineering – 102 years of x-ray diffraction and still going strong”, The Institute of Chemistry of Ireland Congress 2014, September 2014.
191. Zaworotko, M.J. **Invited Lecture**, “Crystal Engineering of Porous Materials”, MOF2014, Kobe, Japan, September 2014.
192. Zaworotko, M.J. **Invited Lecture**, “Crystal Engineering of Task-Specific Materials”, ACS Mid-West Regional Meeting, Columbia, Missouri, November 2014.
193. Zaworotko, M.J. **Invited Lecture**, “The Impact of Pharmaceutical Cocrystals upon API Solubility and Bioavailability”, Solubility and Bioavailability Summit 2014, Philadelphia, PA, December 2014.
194. Zaworotko, M.J.; Lusi, M.; Perry, M., **Invited Lecture**, “Pharmaceutical Cocrystals”, Polymorphism in Pharmaceutical Solids, SSPC Course for Industry, Limerick, Ireland, January 2015.
195. Zaworotko, M.J. **Invited Lecture**. “How crystals are made and why this really matters”, 1st Brasil-Ireland Science Week, Dublin, Ireland, February 2015.

Conference Presentations (excluding presentations by co-workers) – Cont'd

196. Zaworotko, M.J. **Invited Lecture.** "A general perspective on crystal engineering", CECAM workshop on Industrial Challenges of Crystallization, Nucleation and Solubility: Perspectives from Industry, Experiment and simulation, UCD, Dublin, Ireland, June 2015.
197. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Porous Materials", 98th Canadian Chemistry Conference and Exhibition, Ottawa, Canada, June 2015.
198. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Porous Materials", ICMAT2015, Singapore, June 2015.
199. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Ultramicroporous Materials", CASE2015, Dublin, June 2015.
200. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Porous Materials", MC12, 12th International Conference on Materials Chemistry, York, England, July 2015.
201. Zaworotko, M.J. **Commemorative Speaker.** "Hybrid Porous Materials", Golden Jubilee Chemistry Conference, Singapore, August 2015 (declined).
202. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Porous Materials", Gordon Research Conference on Nanoporous Materials and Their Applications, Holderness, NH, August 2015.
203. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Porous Materials", ISIC-15, 15th International Seminar on Inclusion Compounds, Warsaw, Poland, August 2015.
204. Zaworotko, M.J. **Invited Lecture.** "Hybrid Porous Materials", ECM29, 29th European Crystallography Meeting, Rovinj, Croatia, August 2015.
205. Zaworotko, M.J. **Plenary Lecture.** "Crystal Engineering of Task-Specific Materials", 1st Latin American Crystallography Association Meeting, Sao Paulo, Brasil, September 2015.
206. Zaworotko, M.J. **Invited Lecture.** "High Pressure Applications of Porous Metal-Organic Materials", 2015 IUCr High Pressure Workshop, Campinas, Brasil, September 2015.
207. Zaworotko, M.J. **Invited Lecture.** "Why Crystals Matter to the Real World", Science Week 2015, Limerick, November 2015.
208. Zaworotko, M.J. **Eva Philbin Award Lecture.** "Crystal Engineering of Task-Specific Materials – Pharmaceutical Materials", University College Dublin, November 2015.
209. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Ultramicroporous Materials", Pacifichem 2015, Honolulu, December 2015.
210. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering: Form to Function", Fundamentals of the Solid Form: New Insights and Developments, RSC Burlington House, London, March 2016.
211. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Ultramicroporous Materials", 1st Middle-Eastern Materials Science Conference, Abu Dhabi, March 2016.
212. Zaworotko, M.J. **Plenary Lecture.** "Crystal Engineering: Form to Function", British crystallographic Association Spring Meeting, Nottingham, UK, April 2016.
213. Zaworotko, M.J. **Plenary Lecture.** "Crystal Engineering: Form to Function", Science Atlantic Chemistry Conference, Halifax, Canada, June 2016.
214. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering of Hybrid Ultramicroporous Materials", 99th Canadian Chemistry Conference and Exhibition, Halifax, Canada, June 2016.
215. Zaworotko, M.J. **Invited Lecture.** "Crystal Engineering: Its Relevance to Pharmaceutical Science," 3rd Annual Advanced API Convention, Mumbai, India, July 2016.

216. Zaworotko, M.J. **Keynote Lecture.** "Crystal Engineering of Hybrid Ultramicroporous Materials", MOF 2016, Long Beach, CA, USA, September 2016.

Conference/symposium organizer

1. ACS Great Lakes Regional Meeting, DeKalb Illinois, 1990. A symposium on organometallics in synthesis.
2. Halifax CSC 1991: a symposium devoted to main group chemistry.
3. Halifax Atlantic CIC: conference titled "*Synthetic Chemistry in Atlantic Canada*"
4. Guelph CSC 1995: symposium titled "*Back to the Future: A Symposium Celebrating 100 years of X-rays*".
5. Newfoundland CSC 1996: symposium titled "*Extended Metal Systems*" (with C.R. Lucas).
6. Nova Scotia, NATO ASI 1996: two week summer school titled "*Crystal Engineering: The Design and Application of Functional Solids*"(with K.R. Seddon).
7. Cancun, 5th N. American Chemical Congress 1997. "*Crystal Engineering*" (with R.D. Rogers).
8. Washington DC American Crystallographic Association Meeting 1998, Transactions Symposium. "*Crystal Engineering*" (with R.D. Rogers).
9. Anaheim ACS Meeting 1999: Inorganic Division symposium "*Transition metal coordination polymers*" (with R.D. Rogers)
10. Glasgow IUCr, 1999: symposium devoted to crystal engineering (with R.D. Rogers, G.R. Desiraju)
11. Gordon Research Conference, 2000, "*Organic Structures and Properties*" (co-chair with M.D. Ward)
12. Pacifichem 2000, Hawaii, 2000, symposium devoted to applications of crystal engineering (with R.D. Rogers)
13. SERMACS 2002, Charleston, SC, "*Crystals and Nanocrystals by Design*" (with W.T. Pennington).
14. 2nd International Conference on Green and Sustainable Chemistry and 9th Annual Green Chemistry and Engineering Conference, Washington DC, June 2005, "*Non-covalent Derivatization*" (with W. Jones).
15. Indo-USF forum on "*The evolving role of solid-state chemistry in pharmaceutical science*", Delhi, India, February 2012 (with G.R. Desiraju).
16. 2nd Gordon Research Conference on "*Crystal Engineering*", June 2012 (co-vice-chair with C. Aakeröy).
17. 3rd Gordon Research Conference on "*Crystal Engineering*", June 2014 (co-chair with C. Aakeröy).