

Biographical Sketch of Terrence J. Collins

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EDUCATION

University of Auckland, New Zealand

Bachelor of Science—1974

Master of Science with First Class Honors—1975

Doctor of Philosophy—1978

Advisor: Professor Warren R. Roper, FRS

Ph.D. Thesis: Thiocarbonyl Complexes of Ruthenium and Osmium.

Stanford University

Postdoctoral, with Professor James P. Collman—1978–1980

PROFESSIONAL EXPERIENCE

Carnegie Mellon University

Teresa Heinz Professor of Green Chemistry, 2010–present

Director, Institute for Green Science, 2008–present

Thomas Lord Professor of Chemistry, 2001–2010

Director, Institute for Green Oxidation Chemistry, 2001–2007

Professor of Chemistry, 1993–2001

Associate Professor of Chemistry, 1988–1992

California Institute of Technology

Assistant Professor of Chemistry, 1981–1987

Auckland Technical Institute

Lecturer (part-time), 1974–1977

PRIZES, AWARDS AND DISTINCTIONS

2013 – Fellow of the American Chemical Society

2011 – Chairman, Science Advisory Council, The Heinz Center

2011 – Trustee, The Heinz Center, Washington, DC (6-yr appointment)

2010 – Heinz Award for the Environment

2008 – Honorary Fellow of the Royal Society of New Zealand

2008 – Charles E. Kaufman Award of the Pittsburgh Foundation

2007 – Award of the New York Metropolitan Catalysis Society

2007 – Distinguished Alumnus Award, University of Auckland, New Zealand

2006 – Fellow of the International Union of Pure and Applied Chemists

2004 – Pittsburgh Award of the American Chemical Society

2004 – Award of the Baylor University ACS Students Affiliates for Outstanding Achievements in Green chemistry

2002 – Golden Goggles Award, Middle Tennessee State University

2001 – Honorary Professor, University of Auckland, 2001–present

1999 – Presidential Green Chemistry Challenge Award (1998)

1998 – Award of the Japanese Society of Pure and Applied Coordination Chemistry (1997) for leadership research in green chemistry.

1998 – Visiting Professor, Graduate School of Science, Osaka-City University

1996 – Distinguished Visiting Professor, University of Auckland

1986 – Alfred P. Sloan Research Fellow to 1988

1985 – Camille and Henry Dreyfus Teacher-Scholar to 1990

1982 – Occidental Research Corporation (Junior Faculty Award)

1977 – Lindsay Heathcote Briggs Memorial Prize (Best Ph.D. Thesis in Chemistry)

1975 – Postgraduate Scholarship in Chemistry

1973 – Senior Prize in Chemistry

RESEARCH INTERESTS

- Green chemistry
- Inorganic chemistry
- Homogeneous oxidation catalysis
- Design of green oxidants
- Alternative chemistry for oxidation processes that produce persistent pollutants
- Removing endocrine disrupting chemicals from technology
- Bioinorganic chemistry of high oxidation state transition metal species
- Toxicity and ecotoxicity of chemical processes and products
- Preparation of multinuclear transition metal ions with predetermined magnetic exchange coupling properties

PUBLICATIONS

1. Valence-to-Core Detected X-ray Absorption Spectroscopy: Targeting Ligand Selectivity" Author(s): Hall, Eleanor; Pollock, Christopher; Bendix, Jesper; Collins, Terrence; Glatzel, Pieter; DeBeer, Serena, *J. Am. Chem. Soc.* accepted for publication
2. Electrocatalytic Oxygen Evolution with an Immobilized TAML Activator, Demeter, Ethan; Hilburg, Shayna; Washburn, Newell; Collins, Terrence; Kitchin, John, *J. Am. Chem. Soc.*, 2014, 136 (15), pp 5603–5606 DOI: 10.1021/ja5015986
3. Estimation of rate constants in nonlinear reactions involving chemical inactivation of oxidation catalysts, Maria Emelianenko, Diego Torrejon, Matthew A. DeNardo, Annika K. Socolofsky, Alexander D. Ryabov, Terrence J. Collins, *J Math Chem*, **2014**, 52, 1460–1476 DOI 10.1007/s10910-014-0322-4
4. Munmun Ghosh, Kundan K. Singh, Chakadola Panda, Andrew Weitz, Michael P. Hendrich, Terrence J. Collins, Basab B. Dhar, and Sayam Sen Gupta Formation of a Room Temperature Stable Fe^V(O) Complex: Reactivity Toward Unactivated C–H Bonds, *J. Am. Chem. Soc.*, **2014**, Article ASAP, DOI: 10.1021/ja412537m
5. Pueyo, N. C., Raub, A. G., Jackson, S., Metz, M. M., Mount, A. C., Naughton, K. L., Eaton, A. L., Thomas, N. M., Hastings, P., Greaves, J., Blumberg, B., Collins, T. J., Sogo, S. G. Oxidation of Ethidium using TAML Activators: A Model for High School Research Performed in Partnership with University Scientists. *J Chem Educ*, **2013**, 90(3), 326-331
6. C–H Bond Activation of Hydrocarbons by an Fe^VO(TAML) Complex. Assessment of the Nuclear Tunneling Contribution to the Hydrogen Atom Transfer Kinetics, Soumen Kundu, Longzhu Q. Shen, Jasper Van Kirk Thompson, Emile L. Bominaar, Alexander D. Ryabov, and Terrence J. Collins, submitted to *J. Am. Chem. Soc.*
7. Systematic leadership towards sustainability, Göran Broman, Karl-Henrik Robèrt, George Basile, Tobias Larsson, Rupert Baumgartner, Terry Collins, Donald Huisingsh, *J. Cleaner Production* **2013**, <http://dx.doi.org/10.1016/j.jclepro.2013.07.019>
8. Zebrafish Assays as Developmental Toxicity Indicators in the Green Design of TAML Oxidation Catalysts, Lisa Truong, Matthew A. DeNardo, Soumen Kundu, Terrence J. Collins, and Robert L. Tanguay, *Green Chem.*, **2013**, 15, 2339–2343 DOI:10.1039/C3GC40376A
9. J. A. Miller, L. Alexander, D. I. Mori, A. D. Ryabov, T. J. Collins, “In situ Enzymatic Generation of H₂O₂ from O₂ for use in Oxidative Bleaching and Catalysis by TAML Activators”, *New J. Chem.* **2013**, DOI: 10.1039/C3NJ00525A
10. TAML Activator /Peroxide Catalyzed Facile Oxidative Degradation of the Persistent Explosives Trinitrotoluene and Trinitrobenzene in Micellar Solutions, Soumen Kundu, Arani Chanda, Sushil K. Khetan, Alexander D. Ryabov, and Terrence J. Collins, *Environ. Sci. Technol.*, **2013**, 47 (10), 5319–5326, DOI: 10.1021/es4000627
11. Designing endocrine disruption out of the next generation of chemicals, T. T. Schug, R. Abagyan, B. Blumberg, T. J. Collins, D. Crews, P. L. DeFur, S. M. Dickerson, T. M. Edwards, A. C. Gore, L. J. Guillette, T. Hayes, J. J. Heindel, A. Moores, H. B. Patisaul, T. L. Tal, K. A. Thayer, L. N. Vandenberg, J. C. Warner, C. S. Watson, F. S. vom Saal, R. T. Zoeller, K. P. O’Brien, and J. P. Myers, *Green Chem.*, **2013**, 15, 181-19, DOI: 10.1039/c2gc35055

12. A. D. Ryabov, R. Cerón-Camacho, O. Saavedra-Díaz, M. A. DeNardo, A. Ghosh, R. Le Lagadec, T. J. Collins "TAML Activator-based Amperometric Analytical Devices as Alternatives to Peroxidase Biosensors", *Anal. Chem.*, **2012**, *84*(21), 9096-100: doi: 10.1021/ac301714r
13. S. Kundu, M. Annavajhala, I. V. Kurnikov, A. D. Ryabov, T. J. Collins, Experimental and Theoretical Evidence for Multiple FeIV Reactive Intermediates in TAML Activator Catalysis: Rationalizing a Counterintuitive Reactivity Order, *Chem. Eur. J.*, **2012**, *18*, 10244-10249.
14. Facile Destruction of Formulated Chlorpyrifos through Green Oxidation Catalysis, Soumen Kundu, Arani Chanda, Leticia Espinosa-Marvan, Sushil K. Khetan and Terrence J. Collins, *Catalysis Science and Technology*, **2012**, *2*, 1165-1172, DOI: 10.1039/C2CY00447J (Cover art Featured)
15. On the Reactivity of Mononuclear Iron(V)oxo Complexes, Soumen Kundu, Jasper Van Kirk Thompson, Alexander D. Ryabov, and Terrence J. Collins, *J. Am. Chem. Soc.* **2011**, *133*, 18546–18549, DOI: 10.1021/ja208007w
16. Rapid, Biomimetic Degradation of Sertraline in Water by TAML Catalytic Activation of Hydrogen Peroxide, Longzhu Q. Shen, Evan S. Beach, Yan Xiang, Dwight J. Tshudy, Natalya Khanina, Colin P. Horwitz, Mark E. Bier, and Terrence J. Collins, *Environ. Sci. Technol.*, **2011**, *45* (18), 7882–7887, DOI: 10.1021/es201392k
17. Prediction of High-Valent Iron K-edge Absorption Spectra by Time-Dependent Density Functional Theory, P. Chandrasekaran, S. Chantal E. Stieber, Terrence J. Collins, Lawrence Que, Jr., Frank Neese, Serena DeBeer, DOI: [10.1039/C1DT11331C](https://doi.org/10.1039/C1DT11331C) (Paper) *Dalton Trans.*, **2011**, *40*, 11070-11079
18. TAML Activators: Green Chemistry Catalysts as Effective Small Molecule Mimics of the Peroxidase Enzymes, Terrence J. Collins, *Chemistry in New Zealand Journal*, April, **2011**, 72–77; a review to celebrate leading contributions to science of New Zealanders for the International Year of Chemistry.
19. Fe-TAML/Hydrogen Peroxide Degradation of Concentrated Solutions of the Commercial Azo Dye Tartrazine, Evan S. Beach, Ryan T. Malecky, Roberto R. Gil, Colin P. Horwitz, and Terrence J. Collins, *Catal. Sci. Technol.*, **2011**, *1*, 437–443, DOI: 10.1039/C0CY00070A
20. The Green Evolution, Collins, Terrence J., in "Letters to a Young Chemist", Ghosh, Abhik (ed), John Wiley and Sons, Hoboken, NJ, **2011**, 77–93; DOI: 10.1002/9781118007099.ch5
21. Thermodynamic, Electrochemical, High-Pressure Kinetic, and Mechanistic Studies of the Formation of Oxo Fe^{IV}-TAML Species in Water. Delia-Laura Popescu, Melanie Vrabel, Ariane Brausam, Peter Madsen, Gabor Lente, Istvan Fabian, Alexander D. Ryabov, Rudi van Eldik, and Terrence J. Collins, *Inorg. Chem.*, **2010**, *49* (24), pp 11439–11448, DOI: 10.1021/ic1015109
22. Cancer and green chemistry, Teresa Heinz Kerry, Terry Collins and John Warner, Boston Globe July 10, **2010**
23. Oxidation of Pinacyanol Chloride by H₂O₂ catalyzed by Fe^{III} complexed to Tetra Amido Macrocyclic Ligand (TAML): unusual kinetics and product identification, D. A. Mitchell, A. D. Ryabov, S. Kundu, A. Chanda, T. J. Collins " *J. Coord. Chem.*, 2010, *63*, 2605–2618.
24. Fast Water Oxidation Using Iron, Ellis, William Chadwick; McDaniel, Neal D.; Bernhard, Stefan; Collins, Terrence J., *J. Am. Chem. Soc.* **2010**, *132*, 10990–10991, DOI: 10.1021/ja104766z
25. Designing green oxidation catalysts for purifying environmental waters, W. Chadwick Ellis, Camly T. Tran, Riddhi Roy, Marte Rusten, Andreas Fischer, Alexander D. Ryabov, Bruce Blumberg, and Terrence J. Collins, *J. Am. Chem. Soc.* **2010**, *132*, 9774–81 DOI: 10.1021/ja102524v
26. Design of More Powerful Iron-TAML Peroxidase Enzyme Mimics, W. Chadwick Ellis, Camly T. Tran, Matthew A. Denardo, Andreas Fischer, Alexander D. Ryabov, and Terrence J. Collins, *J. Am. Chem. Soc.* **2010**, *131*, 18052–18053, DOI: 10.1021/ja9086837
27. Direct Detection of Oxygen Ligation to the Mn4Ca Cluster of Photosystem II by X-ray Emission Spectroscopy, Yulia Pushkar, Xi Long, Pieter Glatzel, Gary W. Brudvig, G. Charles Dismukes, Terrence J. Collins, Vittal K. Yachandra, Junko Yano, Uwe Bergmann, *Angew. Chem.* **2010**, *49*, 800-803 DOI: 10.1002/anie.200905366
28. D. Banerjee, F. M. Apollo, A. D. Ryabov, and T. J. Collins, The Impact of Surfactants on Fe-TAML-Catalyzed Oxidations by Peroxides: Accelerations, Decelerations, and Loss of Activity, *Chem. Eur. J.*, **2009**, 0000, DOI: 10.1002/chem.200900729
29. Evan S. Beach, Jennifer L. Duran, Colin P. Horwitz, and Terrence J. Collins, Activation of Hydrogen Peroxide by an Fe-TAML Complex in Strongly Alkaline Aqueous Solution: Homogeneous Oxidation Catalysis with Industrial Significance, *Ind. Eng. Chem. Res.* **2009**, *48*, 7072–7076
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31. T. J. Collins, S. K. Khetan and A. D. Ryabov, "Iron-TAML catalysts in green oxidation processes based on hydrogen peroxide", in "Handbook of Green Chemistry", Anastas, P. and Crabtree, R., Eds. pp. 39–77, **2009** WILEY-VCH Verlag GmbH & KgaA, Weinheim.
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37. Chanda, A., Shan, X., Chakrabarti, M., D. L. Popescu, F. T. de Oliveira, L. Que, Jr., T. J. Collins, E. Münck, E. L. Bominaar, A (TAML)FeIV=O complex in aqueous solution: Synthesis, spectroscopic and computational characterization, *Inorg. Chem.*, **2008**, *47*(9),3669-78. Epub 2008 Apr 2
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41. High-Valent First-Row Transition-Metal Complexes of Tetraamido (4N) and Diamidodialkoxido or Diamidophenolato (2N/2O) Ligands: Synthesis, Structure, and Magnetochemistry, Popescu, D.-L., Chanda, A., Stadler, M., Tiago de Oliveira, F., Ryabov, A. D., Münck, E., Bominaar, E. L., Collins, T. J., *Coord. Chem. Rev.*, **2008**, *225*, 2050–2071.
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47. Tiago de Oliveira, F. T.; Chanda, A.; Banerjee, D.; Shan, X.; Mondal, S.; Que, L., Jr.; Bominaar, E. L.; Münck, E.; Collins, T. J., Chemical and spectroscopic evidence for an Fe(V)-oxo complex, *Science*, **2007**, *315*, 835–838.
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- T. J. Collins, Green oxidation catalysis for rapid deactivation of bacterial spores, *Angew. Chem. Int. Edn.* **2006**, *45*, 3974–3977.
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- pulp bleaching*, in 'Green Chemistry: Challenging Perspectives', P. Tundo, ed., Oxford University Press, Oxford, **2000**, pp. 79–105.
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Educational Leadership

- Creator of first university course in green chemistry: Introduction to Green Chemistry, 1992—first by many years.
- Founder and principal lecturer in free web course on green chemistry: Introduction to Green Chemistry, see: <http://igs.chem.cmu.edu/> About 10% of the total envisioned course had been produced and uploaded by March 2012.

Introduction to Green Chemistry

Course Overview: Over the past 150 years the field of chemistry has fostered almost no formal training in toxicity or ecotoxicity. We continue to train chemists to create new products and processes, but not educate them to be aware of the need to protect themselves, other people or the ecosphere from the results of their hard work. Green chemistry offers an alternative. The field was best defined by Paul Anastas in the 1990s as "the design of chemical products and processes that reduce or eliminate the use and generation of hazardous compounds." Stated broadly, this course helps students understand the notion of sustainability and how it applies to chemistry. It also explores the history of chemistry, outlines critical need for green chemistry, and the holistic principles that guide its practice as an emerging and important field of science.

Conference Best Papers/Posters

- Gupta, S. S., D. Lenoir, T. J. Collins, Rapid Destruction of Chlorophenols by Activated Hydrogen Peroxide in Presence of TAML Catalysts, IPOC 16, 16th International Conference on Physical Organic Chemistry, August 4–9, **2002**, San Diego, CA – Best Poster Award.
- Hangun-Balkir, Y., L. Alexandrova, S. K. Khetan, C. Horwitz, A. Cugini, D. D. Link, B. Howard, T. J. Collins, Oxidative desulfurization of fuels through TAML® activators and hydrogen peroxide, Pittsburgh-Cleveland Catalysis Society Meeting, Fortieth Annual Spring Symposium, May 10, **2002**, Pittsburgh PA – Best Paper Award.
- Wingate, K. G., M. J. Robinson, T. R. Stuthridge, T. J. Collins, L. J. Wright, Color and AOX Removal from Bleached Kraft Mill Wastewaters Using Catalytic Peroxide Activators, TAPPI International Environmental Conference, April 7-10, **2001**, Montreal, Canada - Best Paper from Water Quality Category.

SYMPOSIA ORGANIZED

- Member of International Advisory Board, Materials and technologies for green chemistry" in Tallinn, Estonia, September 5-9, 2011
- International Conference on Environment 2010, Green Technologies for Benefit of Bottom Billions, Penang, Malaysia, December 13–15, 2010
- Member of International Advisory Board, International Union of Pure And Applied Chemistry Conference 2010—Chemistry for Sustainable Development, Mauritius, July 26–30, 2010
- Member of International Advisory Board. Third International Conference on Green & Sustainable Chemistry, Delft, The Netherlands, July 1-5, 2007
- Advisory Board, Green Chemistry and Engineering Conference, Washington DC, 2005
- Member of International Advisory Board. Canada-US Joint Workshop on Innovative Chemistry in Clean Media, May 20-21, 2004
- Co-Chair, Green Chemistry and Engineering Conference, Washington DC, 2004
- Member of International Advisory Board. First International Conference on Green & Sustainable Chemistry, Tokyo March 13-15, 2003
- Co-Chair, Green Chemistry and Engineering Conference, Washington DC, 2003
- Member, National Advisory Board for the International Conference on Macrocyclic Chemistry, Lawrence, Kansas, scheduled for June 1994
- Chairman, 1986 Industrial Associates Conference on Oxidation Chemistry, Caltech, February 25–27, 1986.
- 1984 International Chemical Congress of Pacific Basin Societies, Symposium Organizer with Eiichi Kimura and Chris Reed of the Symposium on "New Developments in Coordination Chemistry: Oxygen and Oxidation", Honolulu, Hawaii, December 16 – 21, 1984

- Member, International Advisory Board and Report Editor, the International Workshop on “Activation of Dioxygen Species and Homogeneous Catalytic Oxidations”, Galzignano (Padova) Italy, June 28-29, 1984.

OTHER PROFESSIONAL ACTIVITIES (FROM 1998 ON) *selected examples*

- Interviewed by David Lemberg for “Science and Society”, June 21, **2007**. Podcast available at <http://www.scienceandsociety.net/audio/collins.mp3>
- Lecture, “Green Chemistry; Sustaining a High Technology Civilization”, Environmental Health Lecture Series, Town Hall, Seattle, WA, January 24, **2007**, broadcasted on NPR.
- Interviewed by Diane Horn (Producer and Host) of National Public Radio affiliate NEXP, Seattle for program “Mind Over Matters”
- Creating a New Chemistry, Air date: Week of 04/18/2007, Story length: 7:17, Producer: Reid R. Frazier, The Allegheny Front: environmental radio for Western PA
- Interviewed by Sarah Bennett of the Listener leading to the article, “Toxic Inheritance,” May 5– 11, **2007**.
- Interviewed by Kim Hill for Radio New Zealand on Green Chemistry (37 minutes), Broadcast February 24, **2007**
- Interviewed and profiled for the website of the Collaborative on Health and the Environment, 2006, <http://www.healthandenvironment.org/articles/homepage/614>
- Greening on Chemical World, December 13, 2006, Jennifer McGuiggan on GC and the Institute for Green Oxidation Chemistry, <http://www.popcitymedia.com/features/41greenchem.aspx>
- American Associate Editor of the Royal Society Journal, *Green Chemistry*—2001-2004.
- Member of Editorial Advisory Board of C&E News—2003-2005.
- Support of GC development for society in general and for less advantaged states: Member of ACS Environmental Affairs Committee, Consultant to EPSCOR States on how to develop viable centers in green chemistry research, convener of International Conference on GC, Mumbai January, **2004**.
- Brief to the National Academy of Sciences Committee investigating technologies for killing anthrax on letter supporting machines at Army facilities, November **2003**.
- Member of the Advisory Group, National Academy of Sciences Roundtable on *Science and Technology in Support of a Transition Toward Sustainability*, March **2003**.
- Instructor on the DVD of the ACS and Green Chemistry Institute “Green Chemistry: Meeting Global Challenges”, **2003**.
- PI on grant from ACS-PRF that brought 22 winners of the Presidential Green Chemistry Challenge Award to Congress to meet with legislators and explain the progress and potential of green chemistry. Participated in what were regarded as highly successful meetings with three other Pennsylvania winners personally Senators Santorum and Specter and Congressmen, Doyle and Murphy, explaining the promise of Green Chemistry, November 28-29, **2003**.
- Member, ACS Committee on Environmental Improvement, **2002** –, Associate Member, ACS Committee on Environmental Improvement, 1999 – 2001
- Featured on video of the ACS and the EPA, “Green chemistry: Innovations for a Cleaner World”.
- Quoted widely on the eight-hour 2002 TV component of the multimedia workshop for teacher professional development, “Reactions in Chemistry”, funded by CPB and the Annenberg Foundation.
- National Public Radio Interview with Ira Flatow
<<http://www.npr.org/rundowns/segment.php?wflid=1447823>>
- Integration and Transfer of Knowledge: Since 1998, delivered 145 lectures (>20 international conference plenary lectures and named lectures) outside Carnegie Mellon University on Green Chemistry as a field and the Collins Group research program, including >40 to the general public (279 outside lectures throughout career).
- Consultant for the Green Chemistry Gordon Conferences
- Member of the DOE panel to advise the government on how to spend ca. \$10 M per year for the funding of green chemistry.
- Member of the IUPAC Working Party on Green Chemistry. International consultant helping to script the workshop report for the Organization for Economic Cooperation and Development. Member of writers and coordinators for IUPAC white paper on Green Chemistry.
- United States Representative to the Organization for Economic Cooperation and Development Workshop on the Funding of Sustainable Chemistry, Tokyo, October **2000**
- Member of International Advisory Committee for Japanese Green Chemistry Symposia Series.
- Published first definition of Green Chemistry - ‘Green Chemistry’, Collins, T. J. *Macmillan Encyclopedia of*

Chemistry, Volume 2, Simon and Schuster Macmillan, New York, 1997, 691-697.

- Published one of first educational articles in GC, “Introducing Green Chemistry in Teaching and Research”, T. J. Collins, *J. Chem. Ed.*, 1995, 72, 965–966.
- Participant at many national and international meetings designed to further green chemistry education as noted above.
- Developed first university course on Green Chemistry (taught since 1992).
- Member ACS, Royal Society of Chemistry, Royal Society of NZ, Technical Association of the Pulp and Paper Industry.
- Many interviews and expert opinions expressed in books, magazines and newspapers.

Video Presentations

- Professor Collins course “Introduction to Green Chemistry” is being developed for world-wide distribution—see <http://igs.chem.cmu.edu/> for a demo that shows the general idea—the final site will be approximately 10 times bigger and will include further world leading scholars as teachers for the different areas.
- The Collins Group Presidential Green Chemistry Challenge Award was featured on the ACS video: “Green Chemistry: Innovations for a Cleaner World”
- Professor Collins makes multiple appearances discussing green chemistry and sustainability science on an 8-hour educational series produced by Sally Heldrick under funding from the Annenberg Foundation and the Corporation for Public Broadcasting called “Reactions in Chemistry”, a Professional Development series for High School Teachers— <http://www.learner.org/channel/workshops/chemistry/>
- Professor Collins videotaped an online instruction course in green chemistry (July 23, 2004): <http://mts.sustainableproducts.com/modules/greenchem.html>

INVITED LECTURES, COLLOQUIA AND WEBINARS (in Reverse Chronological Order)

1. July 21, 2014,
2. July 9, 2014,
3. July 8, 2014,
4. July 8, 2014,
5. June 30, 2014,
6. May 21, 2014, Building the Chemical Dimension of a Sustainable Civilization Part II: How should university chemists train the sustainability leaders of the future, Great Lakes Green Chemistry Network and Michigan Green Chemistry Clearinghouse Webinar.
7. February 21, 2014, On “Introduction to Green Chemistry” at Carnegie Mellon University, The University Masters in Sustainability, Brunel University, Uxbridge, UK
8. February 20, 2014, Building the Chemical Dimension of a Sustainable Civilization: the compass and the code, Brunel University, Uxbridge, UK
9. November 25, 2013, Building the Chemical Dimension of a Sustainable Civilization, 1-hr Presentation to 180 H&SS students in Nico Slate Class on Innovation and Social Change, Carnegie Mellon University, Pittsburgh PA
10. November 18, 2013, TAML Activators: high performance peroxidase mimics for rapidly removing chemical (especially endocrine disruptors) and biological contaminants from water, EcoChem Conference, Basel, Switzerland
11. November 13, 2013, Building the Chemical Dimension of a Sustainable Civilization, 1-hr Presentation to freshman chemistry students in Newell Washburn’s Honors Chemistry Class, Carnegie Mellon University, Pittsburgh PA
12. November 6, 2013, Building the Chemical Dimension of a Sustainable Civilization, 2-hr Presentation to Architecture Students in Hartkopf Class, Carnegie Mellon University, Pittsburgh PA
13. November 3, 2013, **STUDENT SEMESTER INVITED LECTURE**, TAML* Activators: design, mechanisms of action and applications of the first full functional, small molecule peroxidase mimics, Chemical Engineering Department, Stanford University, Stanford, CA
14. November 3, 2013, **STUDENT LUNCHTIME PRESENTATION/DISCUSSION**, Building the Chemical Dimension of a Sustainable Civilization, Stanford University, Stanford, CA
15. October 24, 2013, The Design of Green Oxidation Catalysts for Environmental Solutions, **KEYNOTE LECTURE**, Michigan Green Chemistry & Engineering Conference Grand Rapids, MI
16. October 24, 2013, Building the chemical dimension of a sustainable civilization: reorienting the compass, resetting the thinking, Panel Presentation, Michigan Green Chemistry & Engineering Conference, Grand Rapids MI
17. October 15, 2013 Building the Chemical Dimension of a Sustainable Civilization, A 2-hour lecture to ca. 600 students, Central Catholic High School, Pittsburgh PA
18. October 3, 2013, TAML Activators: full functional peroxidase mimics for DoD projects, The Chemical and Biological

19. Defense Program's 2013 Enzyme Colloquium and Program Review, CSC Fairview Park Facility, Falls Church, VA. September 25, 2013, Building the Chemical Dimension of a Sustainable Civilization, II International Congress of Green Chemistry and Engineering, Monterrey, Mexico, 9/25/2013
20. August 20, 2013, High Performance Peroxidase Mimics for Rapidly Removing Chemical and Biological Threats from Water, International Seminars on Planetary Emergencies and Associated Meetings – 46th Session, Erice, Sicily.
21. June 20, 2013, Testing the tiered protocol for endocrine disruption (TiPED) with TAML activators, ACS Green Chemistry and Engineering Conference, The Bethesda North Marriott Hotel and Conference Center, Bethesda, MD
22. April 7, 2013, Two Approaches for Designing Against Endocrine Disruptors, ACS National Conference. Division of Organic Chemistry SESSION: Advances in Green Chemistry
23. March 21, 2013, TAML[®] Activators: design, mechanisms of action and applications of small molecule H₂O₂-activating catalyst, Chemistry Department Seminar, Carnegie Mellon University, Pittsburgh PA
24. February 27, 2013, TAML[®] Activators: design, mechanisms of action and applications of small molecule H₂O₂-activating catalysts, Harvard-MIT Inorganic Colloquium, MIT, Boston, MA
25. February 12, 2013, A Code of Sustainability Ethics, Evening Public Lecture, Environmental Research Center, University of West Virginia, Morgantown, WV
26. January 10, 2013, Two approaches for designing as green chemists against endocrine disruptors, QAFCO-TAMUQ CHEMISTRY CONFERENCE 2013, GREEN CHEMISTRY AND GREEN ENGINEERING, Texas A&M University at Qatar, Doha, Qatar
27. December 11, 2012, Setting the Stage: The Frontier of Toxicology and Molecular Design, Toxicology and Sustainable Molecular Design Conference University of Connecticut, Storrs, CT
28. November 19, 2012, Little Green Solutions to Pharmaceutical Pollution, delivered for me in combination with Susan Jobling, European Environment Agency European and the Center for Environment & Human Health (U. Exeter) Workshop on Strategies to Reduce Emissions of Pharmaceuticals and Metabolites to the Environment, Newquay, Cornwall.
29. November 13, 2012, Intellectual and practical challenges of building a sustainable marketplace, **KEYNOTE LECTURE**, Catching the Wave - Green Chemistry and Economic Development in the Great Lakes Region, Hyatt Regency, Chicago IL
30. November 8, 2012, Sustainability, Central Catholic High School, Pittsburgh, PA—90 minute lecture to ca. 350 students.
31. October 26, 2012, Honoring the Vision of Rachel Carson: On Behalf of the American Chemical Society, 6th Rachel Carson Legacy Conference, *Our Planet and Our Health*, Chatham University, Pittsburgh PA
32. October 25, 2012, On The Health and Global Environmental Consequences of Fracking the Marcellus Shale, Pittsburgh Filmmakers Melwood Screening Room, Pittsburgh, PA
33. October 4, 2012, Sustainability is the Premier Chemical Technology Challenge of the 21st Century, **PLENARY LECTURE**, Holiday Inn, Moon PA
34. September 13, 2012, Successful Degradation of 17 α -Ethinylestradiol and other Pharmaceutical Contaminants with Fe-TAML/H₂O₂, Terrence J. Collins*, Susan Jobling, Karla I. Arias Salazar, Matthew R. Mills, Alice Baynes, Nicola Beresford, Jonathan Porras, *POSTER PRESENTATION*, Low Dose Effects and Non-Monotonic Dose Responses for Endocrine Active Chemicals: Science to Practice, Benjamin Franklin Campus Charité-Universitätsmedizin, Berlin
35. June 18, 2012, What/How should Green Chemists Teach in Toxicity and Ecotoxicity?—Integrating fields to teach sustainability. Symposium on Green Chemistry Education: Teaching Toxicology and Molecular Design, Washington Marriott Wardman, Washington, DC
36. June 12, 2012, Energy and Sustainability, Health Care Without Harm— Symposium on Climate Change and Health, Mellon Institute Auditorium, Carnegie Mellon University, Pittsburgh, PA
37. June 6, 2012, What/How should Green Chemists Teach in Toxicity and Ecotoxicity? Integrating fields to teach sustainability. Symposium on Green Chemistry Education: Teaching Toxicology and Molecular Design, Washington Marriott Wardman
38. May 11, 2012, TAML Activators: purifying water of endocrine disruptors in a new (more cost-effective?) way, UKWIR (UK Water Industry Research), Queen Anne's Gate, London, England
39. May 10, 2012, TAML Activators: purifying water of endocrine disruptors in a new (more cost-effective?) way, Safeguarding Spring Symposium - Brunel University's Institute for the Environment Queen's Anniversary Prize Award Celebration, Brunel University, Uxbridge England
40. April 24, 2012, Green Chemistry: sustaining a high technology civilization, Pittsburgh Chemist's Club and Pittsburgh Environmental Working Group of the American Chemical Society, Spaghetti Warehouse, Pittsburgh, PA
41. April 6, 2012, Green Chemistry: setting the compass toward a sustainable future, Slippery Rock University, Slippery Rock, PA
42. March 26, 2012, TAML[®] Activators: mechanisms of action and applications, Symposium on Sustainable Inorganic Chemistry, ACS National Meeting, San Diego, CA
43. March 4, 2012, Green Chemistry: setting the compass toward a sustainable future, Wallace Stegner Center, S.J. Quinney College of Law University of Utah, Salt Lake City, UT
44. February 27, 2012, Green Chemistry and Sustainability, Carlow University, Pittsburgh PA
45. February 1, 2012, Green Chemistry: sustaining a high technology civilization, **THE SECOND HORIZONS@HEINZ ENVIRONMENTAL SALON**, The University Club, Washington, DC

46. December 12, 2011, TAML Activators: Design, mechanisms of action and applications of the first effective peroxidase mimics—cleaning water of chemical contaminants as nature would do it, Brunel University, Uxbridge, England
47. November 19, 2011, Compass, TEDx Pittsburgh, Nemacolin PA
48. November 8, 2011, The challenge of developmental disruptors for the chemical enterprise, University of Strasbourg, Strasbourg, France
49. November 8, 2011, Sustainability for Chemists: what does it mean? University of Strasbourg, Strasbourg, France
50. November 2, 2011, TAML Activators: Design, mechanisms of action and applications of the first effective peroxidase mimics—cleaning water of chemical contaminants as nature would do it, University of Strasbourg, Strasbourg, France
51. October 7, 2011, Green Science: on the responsibility of chemists to advance science with human health and the environment in mind Mid-Atlantic Association of Liberal Arts Chemistry Teachers Conference, **KEYNOTE**, Hamilton College, Clinton NY
52. September 22, 2011 Oxidizing organic chemicals with TAML catalysts and hydrogen peroxide: design, mechanisms of action and applications of faithful peroxidase mimics, **PLENARY**, Butlerov Congress—Kazan, Tatarstan, Russia
53. September 16, 2011, Green Chemistry: building a chemical economy that works for sustainability, Sustainable Chemistry Summit: from lab to market, **PLENARY**, Kingston, Ontario, Canada
54. August 29, 2011, Integrating Green Chemistry into the Wider Context of Sustainability Creating Innovation by Collaboration in Green Chemistry Among Industry, University Centers and Students, ACS Meeting—Denver
55. August 18, 2011, New green approaches to disinfection and water purification: or the future leaders who did the work. Green Chemistry Leadership Summit—Green Technologies for Developing Nations Workshop, Montego Bay, Jamaica.
56. June 9, 2011, Green Chemistry: what is it?, Presentation to Trustees and Staff of the Heinz Center, Washington, DC
57. May 4, 2011, The Design of TAML[®] Activators: effective small molecule mimics of the peroxidase enzymes, Blekinge Technical Institute, Sustainability Studies Group, Karlskrona, Sweden
58. May 4, 2011, Green Chemistry: on the responsibility of chemists to advance science with human health and the environment clearly in mind, Blekinge Technical Institute, to the Sustainability Studies students, Karlskrona, Sweden
59. April 8, 2011, Green Chemistry: on the responsibility of chemists to advance science with human health and the environment clearly in mind, **CRUM LECTURE: UNIVERSITY CONVOCATION ADDRESS**, Gordon College, Wenham, MA
60. April 7, 2011, The Design of TAML[®] Activators: effective small molecule mimics of the peroxidase enzymes, to the Science Students of Gordon College and environs, Wenham, Ma
61. March 24, 2011, TAML[®] Activators: design, mechanisms of action and applications of Effective peroxidase mimics, **DISTINGUISHED SCIENTIST SEMINAR**, Scripps Institute, March 22, 2011, La Jolla, CA
62. March 21, 2011, Why we need systematic, evolving methodology for assaying endocrine disruption properties to build a meaningful field of Green Chemistry, **OPENING ADDRESS**, Symposium on Linking Green Chemistry and Environmental Health Sciences, Cavallo Point, CA
63. December 7, 2010, Green Chemistry: sustaining a high technology civilization, Central Catholic High School, Pittsburgh, PA
64. December 2, 2010, Green Chemistry as a Strategy for Reducing Hazardous Chemicals in the Environment, Department of Environmental Medicine, University of Rochester Medical Center, Rochester, NY
65. December 1, 2010, Green Chemistry: sustaining a high technology civilization, Rochester Institute of Technology, Rochester, NY
66. November 4, 2010, Green Chemistry: sustaining a high technology civilization, **UNIVERSITY CONVOCATION**, Ohio Wesleyan University, Lecture to Science Faculty and Students, Delaware Ohio.
67. November 4, 2010, Green Chemistry: making water safer, Ohio Wesleyan University, Lecture to Science Faculty and Students, Delaware Ohio.
68. October 14, 2010, TAML Activators as Mimics of Peroxidase Enzymes: design, mechanisms of action and applications, **PLENARY LECTURE**, 2010 Pfizer Green Chemistry Symposium, San Diego CA
69. October 8, 2010, Molecular Design for Hazard Reduction and Remediation, United States Geological Survey Laboratory, Columbia, MO
70. October 7, 2010, Molecular Design for Hazard Reduction and Remediation, Symposium on Green Chemistry: Integrating Environmental Health Research and Chemical Innovation, University of Missouri—Columbia, MO
71. September 24, 2010, Rachel Carson Legacy Conference, Pittsburgh PA
72. August 24, 2010, Iron–TAML activators: Designing ligands to achieve peroxidase mimics, Fall ACS Meeting, Boston, MA
73. August 12, 2010, Green Chemistry: on the Responsibility of Chemists to Advance Science with Human Health and the Environment Clearly in Mind. 21st International Conference on Chemical Education), **PLENARY LECTURE**, Taipei, Taiwan
74. August 5, 2010, Green Chemistry: Sustaining a High Technology Civilization, Indian Institute of Technology, Kanpur, India
75. August 4, 2010, The Design of TAML Activators: effective small molecule mimics of the peroxidase enzymes, Indian Institute of Technology, Kanpur, India
76. August 3, 2010, Green Chemistry: Sustaining a High Technology Civilization, Indian Institute of Technology, Mumbai, India

77. August 2, 2010, The Design of TAML Activators: effective small molecule mimics of the peroxidase enzymes, National Chemistry Laboratory, Pune, India
78. July 30, 2010, Green Chemistry: Sustaining a High Technology Civilization, National Chemistry Laboratory, Pune, India
79. July 26, 2010, Green Chemistry: Sustaining a High Technology Civilization, Chemistry for Sustainable Development (ICPAC 2010), **PLENARY LECTURE**, Mauritius
80. July 5, 2010, The Design of TAML Activators: Effective Small Molecule Mimics of the Peroxidase Enzymes, International Conference on Porphyrins and Phthalocyanines, ICPP-6, Grand Hyatt Tamaya Resort, Santa Ana Pueblo, New Mexico
81. June 15, 2010, TAML Activators: New Hope for Cleaner Water, Green Remediation Conference, University of Massachusetts, Amherst
82. June 15, 2010, Green Remediation: The Environmental Perspective, **PLENARY**, Green Remediation Conference, University of Massachusetts, Amherst
83. May 27, 2010, Green Chemistry: sustaining a high technology civilization, A Rachel Carson Celebration of Biodiversity Honoring E. O. Wilson, Carnegie Music Hall, Pittsburgh, PA
84. May 3, 2010, Green Chemistry: chemists working to acknowledge, learn about and adapt to endocrine disruption, Endocrine Disruption **GORDON CONFERENCE**, Les Diablerets, Switzerland
85. April 20, 2010, Promise and Progress in Green Technology to Protect Future Generations, Second Annual Symposium—Environmentally Literate Healthcare Providers, University of Pittsburgh School of Medicine Center for Continuing Education in the Health Sciences and the Magee-Womens Hospital, Pittsburgh, PA
86. April 15, 2010, Green Chemistry and the Future: the example of iron-TAML activators, Bethany College, Bethany, WV
87. March 23, 2010, Iron-TAML activators of hydrogen peroxide: probing novel approaches for reducing and eliminating recalcitrant pollutants in water, Symposium on the Sustainability of Water Quality, ACS Conference, Moscone Center, San Francisco, California
88. March 23, 2010, Green Chemistry: the example of iron-TAML activators, Symposium on Chemical Applications of Mössbauer Spectroscopy, ACS Conference, Moscone Center, San Francisco, California
89. March 18, 2010, Policy Issues and the reform of the Toxic Substances Control Act (TSCA), Oxford Union Style Debate, Collins as Questioner, Green Chemistry Roundtable Series Manufacturing a Sustainable Economy, New Hazlett Theater, Pittsburgh PA
90. March 1, 2010, Green Chemistry and the Future: the example of iron-TAML activators, 90 minute interview with Terry Collins conducted by Lou Guillette and students, University of Florida, Gainesville, Florida
91. February 29, 2010, Green Chemistry and the Future: the example of iron-TAML activators, University of Tampa, Tampa, Florida
92. February 13, 2010, Green Chemistry in Pesticide Development and Degradation, **PLENARY**, Pesticide Stewardship Alliance, Hyatt Regency, Savannah, Georgia,
93. January 13, 2010, Green Chemistry Roundtable Series Manufacturing a Sustainable Economy—commentator—John Ehrenfeld address: author of Sustainability by Design, Collins as Questioner, ALCOA Headquarters, Pittsburgh, PA
94. December 7, 2009, Iron-TAML Activators: successful mimics of peroxidase enzymes that can transform water purification, University of Michigan, Ann Arbor, Michigan
95. November 29, 2009, Iron-TAML Activators: highly successful mimics of peroxidase enzymes for green chemical applications, **PLENARY LECTURE**, Inorganic Discussion Weekend, University of Guelph, Guelph, Ontario, 11/29/09
96. November 12, 2009, Green Chemistry: the bottom line must adapt to the germline, Philadelphia Area Alumni, University of Philadelphia, Philadelphia PA
97. November 11, 2009, Green Chemistry: the bottom line must adapt to the germline, Princeton Area Alumni, Hamilton, NJ
98. November 9, 2009, Green Chemistry: sustaining an high technology civilization, Pittsburgh Society for Coatings Technology, Harmer, PA
99. November 3, 2009, Green Chemistry: sustaining an high technology civilization, **HUGH AND NANCY LONG LECTURE**, Westminster College, New Wilmington, PA
100. October 30, 2009, Green Chemistry and the Future: the example of Iron-TAML Activators, Department of Chemistry, Cleveland State University, Cleveland,
101. October 23, 2009, Green Chemistry at Carnegie Mellon University: our approach to the tectonic importance of endocrine disruption e-hormone Conference, Tulane and Xavier Universities, New Orleans
102. October 14, 2009, Green Technologies for the Environment: Stimulating Eco Innovation for the Coming Sustainability Revolution, **PLENARY LECTURE**, Sheraton Bradley Hotel, Windsor Locks, CT
103. September 25, 2009, Green Chemistry: Sustaining an High Technology Civilization, **PLENARY LECTURE**, Rachel Carson Legacy Conference, When Chemicals Disrupt: Managing Our Risk, Manchester Craftsmen's Guild, Pittsburgh, Pennsylvania
104. September 15, 2009, Green Chemistry: Sustaining an High Technology Civilization, **UNIVERSITY PUBLIC LECTURE**, University of California, Berkeley, Berkeley, CA
105. September 14, 2009, Green Chemistry and the Future: the example of TAML activators, Department of Chemistry,

- University of California, Berkeley, Berkeley, CA
106. September 14, 2009, Green Chemistry and the Future: the example of Iron-TAML Activators, Department of Chemistry, University of California, Berkeley, Berkeley, CA
 107. August 23, 2009, Rethinking Remediation, 42nd Session of the International Seminars on Planetary Emergencies, Erice, Sicily, Italy
 108. August 21, 2009, Moving the chemical enterprise toward sustainability: Key issues, 42nd Session of the International Seminars on Planetary Emergencies, Erice, Sicily, Italy
 109. July 21, 2009, Iron-TAML activators with peroxide: an effective green chemical approach to the degradation of pharmaceutical agents in water, Green Pharma Summit, Ritz-Carlton Hotel, Philadelphia, PA
 110. July 8, 2009, Green Chemistry and the Future: the example of Iron-TAML Activators, Department of Chemistry, McGill University, Montreal, Canada
 111. May 16, 2009, It's Your World After All, Graduation Ceremony Mellon College of Science Honors Graduates, **KEYNOTE ADDRESS**, Carnegie Mellon University, Pittsburgh, PA
 112. May 16, 2009, It's Your World After All, Phi-Beta-Kappa Initiation Convocation **PLENARY**, Carnegie Mellon University, Pittsburgh, PA
 113. April 22, 2009, Green Chemistry: Sustaining an High Technology Civilization, Edinboro University of Pennsylvania, **UNIVERSITY LECTURE**, Edinboro, PA
 114. December 10, 2008, Iron-TAML activators: highly successful mimics of peroxidase enzymes for green chemical applications, **PLENARY LECTURE**, Blueprints for Sustainable Infrastructure, University of Auckland, New Zealand
 115. December 8, 2008, Iron-TAML Activators: effective small molecule mimics of peroxidase enzymes, Centre of Theoretical Chemistry and Physics, The New Zealand Institute for Advanced Study, Massey University Auckland, North Shore City, December 8, 2008
 116. November 13, 2008, Green Chemistry and the Future, Carnegie Mellon Alumni, LA Chapter, MEIM Center, LA
 117. November 15, 2008, Building the Technological Dimension of a Sustainable Civilization, **PLENARY LECTURE**, Siemens Science Competition, Heinz History Center, Pittsburgh, PA
 118. November 11, 2008, Pursuing Sustainable Technologies: People change people, Central Catholic High School, Pittsburgh PA
 119. October 16, 2008, Green Chemistry and Worker Health and Safety Training, NIEHS, Sheraton Chapel Hill, NC
 120. October 8, 2008, Environmental Health Sciences and Green Chemistry: Problems Meet Solutions—In Summary, **PLENARY LECTURE**, Beckman Center, Irvine CA
 121. September 19, 2008, Sustainability Determinants, Conference Introduction as Conference Co- Chair, Rachel Carson Legacy Conference, Duquesne University, Pittsburgh, PA
 122. September 17, 2008, Iron-TAML Activators: effective small molecule mimics of peroxidase enzymes, Department of Chemistry, University of Wisconsin, Madison
 123. August 18, 2008, Design, performance and mechanistic chemistry of FeIII-TAML activators, Graduate Student Symposium: Transitioning into Green Chemistry, ACS National Meeting, Sheraton Philadelphia City Center Hotel, Philadelphia, PA
 124. July 18, 2008, Green Chemistry and Technology Futures, Presented to the leadership of the United Steelworkers Union, New Haven, CT
 125. July 17, 2008, Iron-TAML activators: highly successful mimics of peroxidase enzymes—Lessons from kinetic and mechanistic studies, **INORGANIC CHEMISTRY GORDON CONFERENCE**, Salve Regina University, Newport, RI
 126. June 4, 2008, Green Chemistry and the Future, Presented to the University of Minnesota electronically from Yale University, New Haven, CT
 127. May 28, 2008, Green Chemistry and the Future, Presentation to Bobby Vagt, President, Heinz Endowments and several other officers, Pittsburgh, PA
 128. May 2, 2008, Green Chemistry and the Future, **UNIVERSITY CONVOCATION ADDRESS**, St. Olaf College, Northfield, Minnesota
 129. April 28, 2008, Green Chemistry and the Future, Presentation to the Upper School, Winchester Thurston Academy, Pittsburgh, PA
 130. April 16, 2008, Green Chemistry and the Future, Rachel Carson Spirit & Nature Conference, Chatham University, Pittsburgh, PA
 131. April 14, 2008, A life in search of sustainability: People change people, **JOURNEYS LECTURE**, Carnegie Mellon University, Pittsburgh, PA
 132. April 7, 2008, Undergraduate researchers excel in green chemistry and oxidation catalysis, **BECKMAN SCHOLARS 10-YEAR ANNIVERSARY PRESIDENTIAL PLENARY SYMPOSIUM**, ACS National Meeting, New Orleans
 133. March 17 2008, Green Chemistry and the Future, **CHARLES E. KAUFMAN AWARD ADDRESS**, Bridgeville, PA
 134. March 18 2008, Green Chemistry and the Future, North Central West Virginia American Chemical Society, Fairmont State University, Fairmont, WV
 135. March 14, 2008, Green Chemistry and the Future, Good Jobs, Green Jobs Conference, Convention Center, Pittsburgh, PA
 136. February 19, 2008, Green Chemistry and the Future, **AFTER-DINNER KEYNOTE LECTURE**, American Institute of Chemical Engineers, University of Pittsburgh, Pittsburgh, PA

137. February 14, 2008, Green Chemistry and the Future, Presentation to the Maine Legislature Standing Committee on Maine Resources, State Capitol, Augusta, ME
138. November 29, 2007, Green Chemistry and the Future, **KEYNOTE LECTURE**, *Health and Environmental Funders Network*, Airlie Conference Center, Warrenton, VA,
139. November 19, 2007, Learning and Developmental Disabilities Initiative National Teleconference, Priming for Prevention, Cyberspace, USA
140. November 14, 2007, The Vision, Research and Educational Program of the Institute for Green Oxidation Chemistry, Citizens for Global Solutions Pittsburgh and the Global Studies Program of the University Center for International Studies at the University of Pittsburgh, Pittsburgh, PA
141. October 26, 2007, Green Chemistry and the Future, **PLENARY LECTURE**, La Roche College, Pittsburgh, PA
142. October 26, 2007, The Vision, Research and Educational Program of the Institute for Green Oxidation Chemistry, Central Catholic High School, Pittsburgh, PA
143. October 10, 2007, The Vision, Research and Educational Program of the Institute for Green Oxidation Chemistry, Central Catholic High School, Pittsburgh, PA
144. October 4, 2007, Yale University, Green chemistry: sustaining a high technology civilization, New Haven, CT
145. September 26, 2007, Green Chemistry and Life Cycle Analysis, EPA Conference on "Pollution Prevention through Nanotechnology", Arlington, VA
146. September 25, 2007, GreenOx Catalysts, Inc.: the green chemistry behind a new Pittsburgh startup, Commercial Development and Marketing Association for the Chemicals Industry Annual Conference, Pittsburgh, PA
147. September 21, 2007, Green chemistry: sustaining a high technology civilization, **PLENARY LECTURE**, The Fire Retardant Dilemma Conference Series: Part 3, Berkeley, CA
148. September 20, 2007, Green chemistry: sustaining a high technology civilization, The Energy and Resources Group Fall 2007 Colloquium Series, U.C. Berkeley, Berkeley CA
149. September 11, 2007, Green Chemistry and the Future: Part B, Innovation Day 2007, Society of the Chemical Industry–Chemical Heritage Foundation, Philadelphia, PA
150. September 11, 2007, Green Chemistry and the Future: Part A, Innovation Day 2007, Society of the Chemical Industry–Chemical Heritage Foundation, Philadelphia, PA
151. August 29, 2007, Green Chemistry and the Future, **PLENARY LECTURE**, 20th Rocky Mountain Regional ACS Meeting (Joint with AIChE), Denver, CO
152. August 19, 2007, Green chemistry and sustainability: essential elements for chemical pedagogy, Boston ACS Meeting in Symposium on Green Chemistry as an Integral Component of Academic Sustainability Centers, Boston MA
153. August 8, 2007, Iron-TAML activators: effective green chemistry catalysts for the oxidative decomposition of Pharmaceuticals and Personal Care Products, 2007 Northeast Water Science Forum, Pharmaceuticals and Personal Care Products: state of the science, Portland, ME
154. August 6, 2007, Certain chemicals are disrupting your hormone system: what can GreenChemistry do protect you and your family? Workshop on Endocrine Disrupting Chemicals, Steelworkers Health, Safety and Environment Conference and the Steelworkers Joint Health, Safety and Environment Conference, Dearborn, MI
155. July 16, 2007, Green Chemistry: Sustaining an High Technology Civilization, University of Pittsburgh, Center on Race and Social Problems, School of Social Work, Pittsburgh, PA
156. July 16, 2007, Green Chemistry: Sustaining an High Technology Civilization, Lunch and Learn, Center for Environmental Oncology, Herberman Auditorium, UPMC Cancer Pavilion, Pittsburgh, PA
157. June 2, 2007, Iron-TAML activators: effective green chemistry catalysts for peroxide activation, Pan American Studies Institute in Green Chemistry, Universidad Iberoamericana, México City, México
158. June 1, 2007, Toxicity and Ecotoxicity: the vital GC challenge of the endocrine disruptors, Pan American Studies Institute in Green Chemistry, Universidad Iberoamericana, México City, México
159. June 6, 2007, Green Chemistry: Sustaining an High Technology Civilization, **KEYNOTE LECTURE**, First Israeli International Conference on Green Chemistry, Porter School of Environmental Studies, Tel Aviv University, Israel
160. May 31, 2007, Green Chemistry: "an ethical imperative", Pan American Studies Institute in Green Chemistry, Universidad Iberoamericana, México City, México
161. May 16, 2007, Iron-TAML activators: effective green chemistry catalysts for peroxide activation, **AWARD ADDRESS**, Catalysis Society of Metropolitan New York, Somerset, NJ
162. May 16, 2007, Green Chemistry: Sustaining an High Technology Civilization, ExxonMobil Research and Engineering Co, Annandale, NJ
163. April 23, 2007, Green Chemistry and the Future, King County Wastewater Treatment Authority and People for Puget Sound, Seattle, WA
164. April 23, 2007, Green Chemistry and the Future, Department of Ecology of Washington State, Olympia, WA
165. April 20, 2007, Green Chemistry and the Future, Women's Health and the Environment: new science, new solutions, Pittsburgh, PA
166. August 6, 2007, Green Chemistry: Sustaining an High Technology Civilization, **PLENARY LECTURE**, Steelworkers Health, Safety and Environment Conference and the Steelworkers Joint Health, Safety and Environment Conference, Dearborn, MI
167. April 4, 2007, Iron-TAML® activators: effective green chemistry catalysts for peroxide activation, Centre College,

- Danville, KY
168. March 26, 2007, Iron-TAML® activators: effective green chemistry catalysts for peroxide activation, Eckard Münck Bader Award Symposium, Chicago ACS, Chicago IL
 169. March 23, 2007, Converging Landscapes: Chemistry meets Toxicology meets the Environment — with a little emphasis on pharmaceuticals, Gordon Cain Conference 2007, New Chemical Bodies: Bio-Monitoring, Body Burden and the Uncertain Threat of Endocrine Disruptors, Chemical Heritage Foundation Conference, Philadelphia, PA
 170. February 27, 2007, Green Chemistry; Sustaining a High Technology Civilization, SCION, Rotorua, New Zealand
 171. February 22, 2007, Green Chemistry: In Search of an Ethics for the Technological Age, IPENZ and Engineers for Social Responsibility, University of Auckland, New Zealand
 172. February 21, 2007, Green Chemistry; Sustaining a High Technology Civilization, **AWARD AND UNIVERSITY LECTURE**, Maidment Theater, University of Auckland, Auckland, New Zealand
 173. January 25, 2007, Green Chemistry; Sustaining a High Technology Civilization, Lunch Round table Discussion, Summit on Environmental Challenges to Reproductive Health and Fertility, University of California, San Francisco, San Francisco, CA
 174. January 25, 2007, Green Chemistry; Sustaining a High Technology Civilization, Oregon Environmental Council Health Sciences Series, Multnomah Athletic Club, Portland, OR
 175. January 24, 2007, Green Chemistry; Sustaining a High Technology Civilization, Environmental Health Lecture Series, Town Hall, Seattle, WA
 176. January 24, 2007, Iron-TAML® activators: effective green chemistry catalysts for peroxide activation, University of Washington, Seattle, WA
 177. December 14, 2006, Green Chemistry and the Future, Presentation to Birchmere, VC, Pittsburgh, PA
 178. December 7, 2006, Green Chemistry and the Future, Presentation to the VC Firm Draper-Triangle, Pittsburgh, PA
 179. December 1, 2006, Green Chemistry and the Future, Presentation to the VC Firm Pennsylvania Early Stage Partners, Pittsburgh, PA
 180. November 15, 2006, Green Chemistry: Sustaining a High Technology Civilization, Greenbuild 2006, Denver, CO
 181. October 30, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Presentation to 40 Venture Capitalists, Carnegie Mellon University, Pittsburgh, PA
 182. October 27, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Louisiana State University, Baton Rouge, LA
 183. October 25, 2006, Green Chemistry and the Future, Presentation to the Heinz Endowments Board of Trustees, Carnegie Mellon University, Pittsburgh, PA
 184. October 17, 2006, Design, Study and Applications of Green Oxidation Catalysts, Kenyon College, Gambier, OH
 185. October 3, 2006, Green Chemistry: a personal view of the challenges and an update on TAML® activator chemistry, Presentation to 10 Classes of Central catholic High School, Pittsburgh, PA
 186. September 12, 2006, Greening Chemistry: what is it?, Egyptian First International Conference in Chemistry, Chemistry for Human Needs in Developing Countries, Sharm El-Shiekh, Egypt
 187. September 12, 2006, Greening Oxidation Catalysis, Egyptian First International Conference in Chemistry, Chemistry for Human Needs in Developing Countries, Sharm El-Shiekh, Egypt
 188. October 16, 2006, Green Chemistry: Sustaining a High Technology Civilization, **UNIVERSITY CONVOCATION ADDRESS**, Kenyon College, Gambier, OH
 189. September 14, 2006, Green Chemistry and Sustainability, Egyptian First International Conference in Chemistry, Chemistry for Human Needs in Developing Countries, **LEADER OF 2.5 HOUR ADDRESS AND DISCUSSION**, Sharm El-Shiekh, Egypt
 190. August 27, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Green Chemistry **GORDON CONFERENCE**, Magdalen College, Oxford, United Kingdom
 191. August 17, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Auckland University, Auckland, New Zealand
 192. August 16, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Waikato University, Hamilton, New Zealand
 193. August 9, 2006, The Design and Development of Green Oxidation Catalysts: real steps toward a less polluted world, Monash University, Melbourne, Australia
 194. August 9, 2006, Designing Green Catalytic Oxidation Processes, Monash University Student Lecture, Melbourne, Australia
 195. July 3, 2006, TAML Oxidant Activators: Design, Chemistry and Applications, ICPP-4, Rome, Italy
 196. June 26, 2006, Green Oxidation Catalysis, 2006 Summer School on Green Chemistry, Washington, DC
 197. June 22, 2006, Solutions Science in Academia: green chemistry and what it offers biodiversity, Consultative Group on Biodiversity, Estes Park, CO
 198. June 6, 2006, Green Chemistry: making it in the real world, Collaborative on Health and the Environment Web Lecture Series
 199. May 18, 2006, Green Chemistry: systematically dealing with toxics, Great Lakes Binational Toxics Strategy Meeting, Delta Chelsea Hotel, Toronto, Canada
 200. May 9, 2006, Green Chemistry 101 Primer, NSCMP Core Group, Holiday Inn Rosslyn at Keybridge, Arlington VA

201. May 3, 2006, Green Chemistry and Sustainability, Pittsburgh Chemistry Olympics-Chevron Science Center, Pittsburgh, PA
202. April 25, 2006, The Design of Green Catalytic Oxidation Processes, Dickinson College, Carlisle PA
203. March 21, 2006, Green Chemistry 101, Veolia Water Leadership, Moon Township, PA
204. March 7, 2006, Green Chemistry: developing sustainable alternatives to polluting technologies, Society of Toxicologists Meeting, San Diego, CA
205. January 30, 2006, Green Chemistry 101, Presentation to >80 Environmental Advocate Organizations, Hotel Washington, Washington, DC
206. January 30, 2006, Green Chemistry 101, Presentation to \approx 40 Environmental and Health Funding Foundations, Hotel Washington, Washington, DC
207. January 20, 2006, Green Chemistry at Carnegie Mellon University and Thinking about How to Make Pittsburgh the Capital City of the Sustainable Economy *Pittsburgh Green Drinks, Buffalo Blues*, Pittsburgh, PA
208. January 11, 2006, Degradation of Lipitor and Zoloft with Fe-TAML/H₂O₂ presentation with Dr. Yan Xiang, Pfizer Central Research, Groton, CT
209. December 14, 2005, Designing Green Oxidation Processes, Joint Japan-US Workshop on Sustainable Chemical Synthesis, Honolulu, HI
210. November 30, 2005, Design, Study and Applications of Green Oxidation Catalysts, Penn State Erie-The Behrend College, Erie, PA
211. November 5, 2005, Sustaining a High Technology Civilization, Elk Regional Health Center Women's Health Conference, St. Mary's, PA
212. November 4, 2005, Sustaining a High Technology Civilization, Carnegie Mellon University International Festival, Pittsburgh, PA
213. October 28, 2005, Designing Green Oxidation Technologies, Midwest Regional ACS Meeting— Green Chemistry Symposium, October 28, 2005, Joplin, MO
214. October 20, 2005, Design, Study and Applications of Green Oxidation Catalysts, Stanford University, Stanford CA
215. October 14, 2005, Greening Our Civilization Through Science, Bioneers Conference, San Rafael, CA
216. October 7, 2005, Greening Our Civilization Through Science, **PLENARY LECTURE**, Chemistry Discipline Faculty Workshop 2-year and 4-year Colleges of Minnesota State Colleges and Universities System, Minnesota Minneapolis Community and Technical College, Minneapolis MN
217. October 6, 2005, Green Chemistry and the Building of the Sustainable Economy, Activated Carbon Conference, **PLENARY LECTURE**, Moon Township, PA
218. October 4, 2005, Making Pittsburgh the Capital City of the Sustainable Economy, Technology Transfer Conference for Foundations and Economic Development Organizations, Carnegie Mellon University, Pittsburgh PA
219. September 21, 2005, Ethics, Toxicity, Ecotoxicity, Persistence, Bioaccumulation and Green Chemistry, Central Catholic High School, Pittsburgh, PA
220. August 29, 2005, TAML Green Oxidation Catalysis for Safely Destroying Pollutants and Microbes in Water, ACS Meeting, Washington, DC
221. July 30, 2005, Moderator of Panel Presentations on Green Chemistry, The Beckman Scholars Conference, Irvine, CA
222. July 11, 2005, Ethics, Toxicity, Ecotoxicity, Persistence, Bioaccumulation and Green Chemistry: Part II, Exxon Summer School on Green Chemistry, McGill University, Montreal, Canada
223. July 11, 2005, Ethics, Toxicity, Ecotoxicity, Persistence, Bioaccumulation and Green Chemistry: Part I, Exxon Summer School on Green Chemistry, McGill University, Montreal, Canada
224. July 9, 2005, Greening Oxidation Catalysis, Exxon Summer School on Green Chemistry, McGill University, Montreal, Canada
225. June 23, 2005, Designing Green Catalytic Oxidation Technologies, 2nd International Green Chemistry and Engineering Conference, Washington, DC
226. June 22, 2005, The Need for Incorporating Understanding of Toxicity and Ecotoxicity into Chemistry, 2nd International Green Chemistry and Engineering Conference, Washington, DC
227. June 21, 2005, Green Decontamination System for Chemical and Biological Weapons of mass Destruction, 2nd International Green Chemistry and Engineering Conference, Washington, DC
228. June 20, 2005, Greening Oxidation Catalysis—Student Workshop, 2nd International Green Chemistry and Engineering Conference, Washington, DC
229. June 17, 2005, Design, Mechanism of Action, and Applications of Green Oxidation Catalysts, **PLENARY LECTURE**, Annual Meeting of the Pittsburgh-Cleveland Catalysis Society, Pittsburgh, PA
230. June 1, 2005, Greening Oxidation Catalysis, Conference on Knowledge-Based Materials and Technologies for Sustainable Chemistry, **PLENARY LECTURE**, Tallinn, Estonia
231. May 30, 2005, Understanding Homogeneous Oxidation Catalysis: mechanistic investigation of the stability and function of iron-TAML peroxide activators, Eotvos University, Budapest, Hungary
232. May 26, 2005, A Green Oxidative Approach for Rapid Total Degradation of Thiophosphate Pesticides, 8TH HCH and Pesticides Forum for Central European and Eastern European, Caucasus and Central Asia Countries, Sofia, Bulgaria
233. May 19, 2005, Designing Green Oxidation Technologies” Lecture to Environmental Commissioner of Maine (Dawn Gallagher) and leaders of the Maine DEP and pulp and paper industry, Augusta, ME

234. July 29, 2005, **PLENARY LECTURE**, Bayer School of Natural and Environmental Sciences Undergraduate Research Symposium, Duquesne University, Pittsburgh PA
235. April 19, 2005, Sustainability Ethics and Chemistry: How to build a sustainable technology base, **PLENARY LECTURE**, Symposium on Universal Relationships and Responsibilities: Sustainable living practices for social and cultural wellbeing, Perth, Australia
236. March 31, 2005, Designing Green Oxidation Technologies, Commonweal Retreat on Green Chemistry, Bolinas, CA
237. March 30, 2005, Green Chemistry: Solving the Technical Challenges of Sustainability, Commonweal Retreat on Green Chemistry, Bolinas, CA
238. March 13, 2005, Green Oxidation Catalysts for Environmental Applications, Symposium on Environmental Applications of Inorganic Chemistry, San Diego ACS Meeting, San Diego, CA
239. February 25, 2005, Green Chemistry and Agriculture, **PLENARY LECTURE**, Southeastern Leadership Conference, Department of Agriculture, Savannah, GA
240. February 15, 2005, A Superior Decontamination System for Chemical and Biological Warfare and Defense, **KEYNOTE LECTURE**, Rydges Hotel, Melbourne, Australia
241. February 2, 2005, Greening Civilization through Science, lecture to the science students and Pennsylvania-Ohio Border Section of the ACS, New Wilmington, PA
242. December 9, 2004, Designing Green Oxidation Technologies, **PITTSBURGH AWARD ADDRESS**, Sheraton Hotel, Pittsburgh, PA
243. December 3, 2004, Greening Civilization Through Science, To the Science Students, Illinois Wesleyan University, Bloomington, IL
244. November 29, 2004, Designing Green Oxidation Technologies, To Governor John Baldacci & DEP Leadership, Augusta, ME
245. November 29, 2004, Designing Green Oxidation Technologies, To Commissioner Dawn Gallagher & DEP Leadership, Augusta, ME
246. November 18, 2004, Green Chemistry, Steinbrenner Institute Carnegie Mellon University, Pittsburgh, PA
247. November 13, 2004, A Novel Catalytic Oxidative Decontamination System for Chemical and Biological Warfare Defense, SERMACS, Durham, NC
248. November 3, 2004, Greening Our Civilization Through Science, Chatham College, Pittsburgh, PA
249. November 1, 2004, Research in Green Chemistry, SURG Lunch Seminar Series, Carnegie Mellon University, Pittsburgh, PA
250. October 21, 2004, Greening Our Civilization Through Science, **KEYNOTE LECTURE**, Mid-Atlantic Association of Liberal Arts College Teachers Annual Conference, Juniata College, Huntingdon, PA
251. October 20, 2004, The Design, Development and Utility of TAML Activators, Society of Environmental Journalists, Carnegie Mellon University, Pittsburgh, PA
252. October 20, 2004, Greening Our Civilization Through Science, Society of Environmental Journalists, Carnegie Mellon University, Pittsburgh, PA
253. October 19, 2004, Greening Our Civilization Through Science, **UNIVERSITY LECTURE**, Bowdoin College, Brunswick, ME
254. October 19, 2004, Designing Green Oxidation Technology, Bowdoin College, Brunswick, ME
255. October 8, 2004, Designing Green Oxidation Technology, Arch Chemicals, Southington, CT
256. September 30, 2004, Greening the Planet through Science, The Covenant at South Hills, Bower Hill Road, Mt. Lebanon, PA
257. September 20, 2004, Persistence, Bioaccumulation and Endocrine Disruption in Understanding Pollutants and How to Deal with Them, Faculty Workshop, Clemson University, Clemson, SC
258. September 20, 2004, Designing Green Oxidation Technology, Science Technology and Society University Lecture, Clemson University, Clemson, SC
259. September 20, 2004, Green Chemistry: Sustaining a High Technology Civilization, Honors Students Lecture, Clemson University, Clemson, SC
260. August 26, 2004, Greening the Planet through Science, **KEYNOTE LECTURE**, MCS Orientation, Carnegie Mellon University, Pittsburgh, PA
261. August 22, 2004, Designing Green Oxidation Technologies, **PLENARY LECTURE**, Symposium on Sustainability in the Chemical Industry—IEC, 228th ACS Conference, Philadelphia, PA
262. August 22, 2004, Understanding the Persistent Pollutant, Symposium on Green Chemistry for Graduate Students, 228th ACS Conference, Philadelphia, PA
263. August 6, 2004, The Ethics of Green Chemistry, ACS-PRF Green Chemistry Summer School, Carnegie Mellon University, Pittsburgh, PA
264. August 6, 2004, Designing Green Oxidation Technologies, ACS-PRF Green Chemistry Summer School, Carnegie Mellon University, Pittsburgh, PA
265. August 5, 2004, Understanding the Persistent Pollutant, ACS-PRF Green Chemistry Summer School, Carnegie Mellon University, Pittsburgh, PA
266. August 3, 2004, Greening Energy, ACS-PRF Green Chemistry Summer School, Carnegie Mellon University, Pittsburgh, PA

267. May 18, 2004, A Novel Catalytic Oxidative Decontamination System for Chemical and Biological Warfare Defense, Decontamination 2004 Conference, Palm Harbor, FL
268. May 5, 2004, Designing Green Oxidation Technologies, Department of Agriculture, Florence, SC
269. April 30, 2004, Green Chemistry: Sustaining a High Technology Civilization, University of Mexico, Mexico City, Mexico
270. April 21, 2004, Green Chemistry: Sustaining a High Technology Civilization, ACS Student Affiliates Lecture, Bethany College, WV
271. April 14, 2004, Green Chemistry: Sustaining a High Technology Civilization, CleanMed 2004 Conference, Philadelphia, PA
272. March 29, 2004, Green Oxidation Catalysts: Iron-TAML Activators of Oxygen and Peroxides, ACS Symposium on Non-Heme Iron Chemistry in Biology, 227th ACS National Meeting, Anaheim, CA
273. March 27, 2004, Green Chemistry: Sustaining a High Technology Civilization, After-Dinner Lecture DivCHED Annual Banquet, 227th ACS National Meeting, Anaheim, CA
274. March 27, 2004, The Precautionary Principle and Endocrine Disruption: Connections, Lecture to the ACS Committee on Environmental Improvement, 227th ACS National Meeting, Anaheim, CA
275. March 19, 2004, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, Eotvos University, Budapest, Hungary
276. March 18, 2004, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, University of Debrecen, Debrecen, Hungary
277. March 13, 2004, Techniques for Attracting Manuscripts, Royal Society of Chemistry Editor's Symposium, Glasgow, Scotland
278. March 5, 2004, Green Chemistry: Sustaining a High Technology Civilization, Department of Chemistry, Baylor University, Waco, TX
279. March 3, 2004, The Problem of the Persistent Pollutant, Southern Methodist University, Dallas, TX
280. March 2, 2004, The Design and Development of Green Oxidation Processes, Southern Methodist University, Dallas, TX
281. March 29, 2004, Designing Catalysts for Green Oxidation Technologies, Society Committee on Education, **EMINENT SCIENTIST LECTURE**, 227th ACS National Meeting, Anaheim, CA
282. March 4, 2004, Designing Chemical Technologies for Sustainability, **UNIVERSITY CONVOCATION ADDRESS**, Baylor University, Waco, TX
283. March 1, 2004, Green Chemistry: Sustaining a High Technology Civilization, Gartner Honors Lecture Series, **UNIVERSITY CONVOCATION ADDRESS**, Southern Methodist University, Dallas, TX
284. February 26, 2004, Green Chemistry: Sustaining a High Technology Civilization, Berea College, Berea, KY
285. February 25, 2004, Designing Chemical Technologies for Sustainability, **UNIVERSITY CONVOCATION ADDRESS**, Berea College, Berea, KY
286. February 20, 2004, The Design and Development of Green Oxidation Processes, ACS Affiliates Lecture, University of Pittsburgh, Pittsburgh, PA
287. February 5, 2004, The Design of Green Oxidation Processes, Science and Humanities Scholars, Carnegie Mellon University, Pittsburgh, PA
288. January 21, 2004, The Design of Green Oxidation Processes, ALCOA Sigma Xi Chapter, New Kensington, PA
289. December 13, 2003, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, University of Hawaii at Manoa, HI
290. December 2, 2003, Design of Techniques and Technologies that Unite the Future of Chemistry with the Pursuit of a Sustainable Civilization, New Zealand Institute of Chemistry Conference, **PLENARY LECTURE**, Nelson New Zealand
291. November 27, 2003, The Design and Development of Green Oxidation Technologies, Society of Pure and Applied Coordination Chemistry (JAPAN)-10, **PLENARY LECTURE**, Auckland New Zealand
292. November 24, 2003, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, University of Western Australia, Perth, Australia
293. November 21, 2003, Sustainability Ethics: directions for green chemistry education/R&D, **WHOLE STUDENT BODY LECTURE**, Miranda College, Delhi University, New Dehli, India
294. November 20, 2003, Development of Green Oxidation Catalysis for Water Purification, Indo-US S&T Forum Workshop on Green Chemistry, Connaught Hotel, Delhi, India
295. November 18, 2003, The Design of Green Oxidation Catalysts, Indo-US S&T Forum Workshop on Green Chemistry, Connaught Hotel, Delhi, India
296. November 17, 2003, Sustainability Ethics: directions for green chemistry education/R&D, Indo-US S&T Forum Workshop on Green Chemistry, Connaught Hotel, Delhi, India
297. November 13, 2003, Green Chemistry: Sustaining a High Technology Civilization, Department of Chemistry, University of Leiden, Netherlands
298. November 6, 2003, C&E News Editorial Advisory Board, Sustainability and Innovation: the good future for chemistry, **FOCUS LECTURE FOR BOARD MEETING**, American Chemical Society Headquarters, Washington, DC
299. November 3, 2003, Designing Catalysts for Green Oxidation Technologies, Pfizer Conference on Green Chemistry,

- Groton, CT
300. October 31, 2003, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, University of North Carolina, Chapel Hill, NC
 301. October 15, 2003, Design to Unite Chemical Research with the Pursuit of a Sustainable Civilization, **PLENARY LECTURE**, Annual Conference of the Brazilian Society of Analytical Chemists, Sao Luis, Brazil
 302. October 7, 2003, Design to Unite Chemical Research with the Pursuit of a Sustainable Civilization, **COLLEGE CONSORTIUM ADDRESS**: Twelve Small Colleges in the Chicago area at Benedictine University, Lisle, IL
 303. October 6, 2003, The Importance of *Sustainability Ethics*, *Toxicity* and *Ecotoxicity* in the Training of Future Chemists, Otterbein College, Columbus, OH
 304. October 5, 2003, Sustaining Ethics and Green Chemistry: Developing a Sustainable High Technology Civilization, **UNIVERSITY CONVOCATION**, Otterbein College, Columbus, OH
 305. October 2, 2003, Green Chemistry: Sustaining a High Technology Civilization, Hendrix College, Conway, AR
 306. October 1, 2003, Design to Unite Chemical Research with the Pursuit of a Sustainable Civilization, **UNIVERSITY CONVOCATION ADDRESS**, Hendrix College, Conway, AR
 307. September 25, 2003, Design to Unite Chemical Research with the Pursuit of a Sustainable Civilization, **KECK ENDOWED LECTURE**, Allegheny College, Meadville PA
 308. July 8, 2003, Sustainability Ethics, Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 309. July 8, 2003, Persistence and Bioaccumulation in Understanding Pollutants and How to Deal with Them, Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 310. July 8, 2003, The Importance of Moral and Sustainability Ethics in the Chemical Industry: Reflections on "Trade Secrets," Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 311. July 8, 2003, Considerations on Safe Energy: Reflections on "Meltdown at Three Mile Island," Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 312. July 11, 2003, "The Design of Green Oxidation Catalysts", Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 313. July 8, 2003, Pan American Advanced Studies Institute on Green Chemistry, Montevideo, Uruguay
 314. June 29, 2003, "The Importance of Sustainability Ethics, Toxicity and Ecotoxicity in the Training of Future Chemists", in ACS Blue Ribbon Education Conference "Exploring the Molecular Vision Washington, DC"
 315. June 26, 2003, Training in Sustainability Ethics, Toxicity and Ecotoxicity: Fundamentals of a Safe America, Roundtable on Safety, Green Chemistry & Engineering Conference, Washington, DC
 316. May 24, 2003, New Iron Oxygen Chemistry, Eckard Münck 65th Birthday Symposium, Carnegie Mellon University, Pittsburgh, PA
 317. May 1, 2003, Designing Green Oxidation Catalysts, Massachusetts Green Chemistry Conference, Andover, MA
 318. April 26, 2003, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Society of Analytical Chemists of Pittsburgh Symposium on Green Chemistry, Duquesne University, Pittsburgh, PA
 319. April 30, 2003, Eliminating Persistent Pollutants with Green Catalysis, **PLENARY LECTURE**, Massachusetts Green Chemistry Conference, Andover, MA
 320. April 10, 2003, Green chemistry: Sustaining a high-technology civilization, **UNIVERSITY CONVOCATION ADDRESS**, University of Tennessee, Martin, TN
 321. April 10, 2003 The Problem of Endocrine Disruptors, University of Tennessee at Martin (Honors Students), Martin, TN
 322. April 10, 2003 The Problem of The Persistent Pollutant, University of Tennessee at Martin (Honors Students), Martin, TN
 323. April 9, 2003, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Kentucky Lake Section of ACS, Union City, TN May 19, 2003, "Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes", **PLENARY LECTURE**, EU COST Workshop on GC and EU Conference on GC, Poitiers, France
 324. March 23, 2003, Green chemistry: Sustaining a high-technology civilization, Division of Information Science, Symposium: Librarian Watch: Introduction to New Hot Areas in Chemistry, 225th ACS National Meeting, New Orleans, LA
 325. February 4, 2003, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, **PLENARY LECTURE**, Australia/New Zealand Biennial Conference on Inorganic Chemistry, University of Melbourne, Melbourne, Australia
 326. January 11, 2003, Designing Catalysts for Green Oxidation Technologies, **KEYNOTE ADDRESS**, New York Division of the American Chemical Society, Columbia University, New York, NY
 327. November 22, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, New York Academy of Sciences, New York, NY
 328. November 12, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, 3rd Green Chemistry Conference of Spain, Barcelona, Spain
 329. November 5, 2002, Designing Catalysts for Green Oxidation Technologies, Department of Chemistry, University of Rochester, Rochester, NY
 330. October 31, 2002, Green Chemistry: Sustaining a High Technology Civilization, Lectureship Series in Environmental Studies, Brown University, Providence, RI
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332. October 24, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, 37th Annual Midwest ACS regional Conference, Symposium on Green Catalysis, Lawrence, KS
333. October 15, 2002, Green Chemistry: Achieving a Sustainable Economy, Roundtable Discussion, Conference on Nuevas tecnologías y sostenibilidad, Universidad Internacional Menéndez Pelayo, Valencia, Spain
334. October 16, 2002, Green Chemistry: Sustaining a High Technology Civilization, Conference on Nuevas tecnologías y sostenibilidad, Universidad Internacional Menéndez Pelayo, Valencia, Spain
335. October 9, 2002, Green Chemistry: Sustaining a High Technology Civilization, Central catholic High School (90 mim. Presentation to 8 classes), Pittsburgh, PA
336. September 26, 2002, Green Chemistry: Sustaining a High Technology Civilization, Denison University, Granville, OH
337. September 23, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, **BAYER LECTURE**, Notre Dame University, South Bend, IN
338. September 16, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Center for Environmental Research and Technology, University of Bremen, Germany
339. September 8, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Green Chemistry **GORDON CONFERENCE**, Queens College Oxford, United Kingdom
340. August 15, 2002, Designing Catalysts for Green Oxidation Technologies, NSF Workshop on Environmentally Benign Process Research Needs, Jiminy Peak Resort, Berkshires, MA
341. July 26, 2002, Catalysis as a Tool for Replacing Polluting Processes with Green Chemical Technologies, Sixth Annual Beckman Scholars Symposium, Arnold and Mabel Beckman Center of the National Academies of Sciences, Irvine, CA
342. July 22, 2002, Sustainability Science and the Economy of the Future, First German Summer School on Green and Sustainable Chemistry, Freising, Germany
343. July 22, 2002, Designing Catalysts for Green Oxidation Technologies, **PLENARY LECTURE**, First German Summer School on Green and Sustainable Chemistry, Freising, Germany
344. June 26, 2002, Activation of Hydrogen Peroxide for Green Chemical Processes, **PLENARY LECTURE**, Sixth Green Chemistry and Engineering Conference, Georgetown University, Washington, DC
345. May 28, 2002, Activation of Hydrogen Peroxide for Green Chemical Processes, University of Hong Kong, Hong Kong
346. May 22, 2002, Activation of Hydrogen Peroxide for Green Chemical Processes, **PLENARY LECTURE**, 5th International Symposium on Green Chemistry—China, Hefei City, Anhui Province, China
347. May 15, 2002, Green Chemistry: Sustaining a High Technology Civilization, Central Catholic High School, Pittsburgh, PA
348. May 13, 2002, Green Chemistry: Sustaining a High Technology Civilization, Chemical Sciences Roundtable of the national Academy of Sciences, Georgetown, DC
349. April 10, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Symposium on Agricultural Application in Green Chemistry, 223rd National Meeting of the American Chemical Society, Orlando, FL
350. April 16, 2002, Green Chemistry: Sustaining a High Technology Civilization, **GOLDEN GOGGLES AWARD ADDRESS**, Middle Tennessee State University, Murfreesboro, TN
351. April 7, 2002, Novel Green Chemical Applications of TAML Activators of Hydrogen Peroxide, Symposium on Catalysis in Green Chemistry, 223rd National Meeting of the American Chemical Society, Orlando, FL
352. April 5, 2002, Darkness in El Dorado: interpretations for a better future, **PLENARY LECTURE**, International Conference on “Darkness in El Dorado”, Cornell University, Ithaca, NY
353. April 4, 2002, Green Chemistry: Sustaining a High Technology Civilization, **UNIVERSITY CONVOCATION ADDRESS**, Augustana College, Rock Island, IL
354. March 27, 2002, Green Chemistry at Carnegie Mellon University, Dept. of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA
355. February 14, 2002, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Dept. of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA
356. December 5, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, National Conference on Molecules for Life, Joint Meeting of the NZ Society for Biochemistry and Molecular Biology, NZ Institute of Chemistry and the NZ Biotechnology Association, Napier, New Zealand
357. November 19, 2001, Sustainability Science and the Economy of the Future, Osaka City University, Osaka, Japan
358. November 17, 2001, Sustainability Science and the Economy of the Future, Commemorative Symposium for KYOUSEI Center, Nara Women’s University, Nara, Japan
359. November 16, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Green Chemistry Forum, Kyoto, Japan
360. November 15, 2001, Sustainability Science and the Economy of the Future, Osaka Prefecture University, Osaka, Japan
361. November 14, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Osaka City University, Osaka, Japan
362. October 26, 2001, Allegheny College, Meadville, PA
363. October 19, 2001, Shippensburg University, Shippensburg, PA
364. August 20, 2001, MCC-8: Symposium on metal ions, complexes and clusters in macromolecular systems, Polytechnic University, Brooklyn, NY
365. July 5, 2001, Green Chemistry: Sustaining an High Technology Civilization, Public Lecture, The Museum of Otago,

- Dunedin, New Zealand
366. July 5, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Department of Chemistry, University of Otago, Dunedin, New Zealand
367. July 2, 2001, 2001, Science and the Ethics of Sustainability, ChemEd Conference 2001, University of Canterbury, Christchurch, New Zealand
368. June 28, 2001, Green Chemistry: On the responsibility of chemists to promote sustainability, 90 Minute Lecture to Canterbury High School Teachers, St. Margaret's College, Christchurch, NZ
369. June 28, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, Department of Chemistry, University of Canterbury, Christchurch, New Zealand
370. June 18, 2001, Green Chemistry: Sustaining an High Technology Civilization, Reckitt-Benkiser, Montvale, NJ
371. December 5, 2001, Green Chemistry and the Economy of the Future, **KEYNOTE LECTURE**, National Conference on Molecules for Life, Joint Meeting of the NZ Society for Biochemistry and Molecular Biology, NZ Institute of Chemistry and the NZ Biotechnology Association, Napier, New Zealand
372. November 13, 2001, Catalytic Activation of Hydrogen Peroxide for Green Chemical Processes, **KEYNOTE LECTURE**, Second National Symposium of the Green & Sustainable Chemistry Network (GSCN), Yokohama, Japan
373. July 4, 2001, Green Chemistry: Sustaining an High Technology Civilization, **PLENARY LECTURE**, ChemEd Conference 2001, Department of Chemistry, University of Canterbury, Christchurch, New Zealand
374. June 29, 2001, Green Chemistry: On the responsibility of chemists to promote sustainability, **MELLOR LECTURE** of the New Zealand Institute of Chemistry and the Royal Society of New Zealand, Wellington, New Zealand
375. May 11, 2001, Green Chemistry: Sustaining an High Technology Civilization, Applied Physics Laboratory, Johns Hopkins University, Baltimore, MD
376. April 24, 2001, Green Chemistry: Sustaining an High Technology Civilization, **KEYNOTE ADDRESS** at the Innovation and pioneering celebration of Bayer USA, Moon, PA
377. April 12, 2001, Green Chemistry: Sustaining an High Technology Civilization, Department of Chemistry, University of Illinois, Urbana-Champaign, IL
378. April 2, 2001, Green Chemistry: On the responsibility of chemists to promote sustainability, 90 Minute Workshop given under auspices of the Society and Education Division, ACS National Meeting, San Diego, CA
379. March 7, 2001, Green Chemistry: Sustaining an High Technology Civilization, Oberlin College, Oberlin, OH
380. January 18, 2001, Green Chemistry: Sustaining an High Technology Civilization, Indian Institute of Technology,, Khargpur, India
381. January 17, 2001, Green Chemistry: Sustaining an High Technology Civilization, Indian Association for the Cultivation of Science, Jadavpur, Calcutta, India
382. January 15, 2001, Green Chemistry: Sustaining an High Technology Civilization, Indian Institute of Technology, Kanpur, India
383. January 13, 2001, Green Chemistry: Sustaining an High Technology Civilization, US Environmental Protection Agency Research Laboratories, Cincinnati, OH
384. January 11, 2001, Green Chemistry: Sustaining an High Technology Civilization, IUPAC Conference on Green Chemistry, **PLENARY LECTURE**, New Delhi, India
385. November 7, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Geneva College, Beaver Falls, PA
386. October 3, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Unilever Research, Chester, England
387. November 1, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Johns Hopkins University, Baltimore, MD
388. October 24, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Yale University, New Haven, CT
389. October 3, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Unilever Research, Chester, England
390. September 22, 2000, Catalytic peroxide activation: Pulp bleaching, color and AOX abatement, 8th International Activated Carbon Conference, Moon Township, PA
391. August 24, 2000, TAML® Peroxide Activators: Chemistry and Applications in Paper and Textile Effluent Treatment, 220th ACS National Meeting, Washington, DC
392. August 10, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, Atofina Corporation, King of Prussia, PA
393. August 1, 2000, Green Chemistry: On the Responsibility of Chemists to Promote Sustainability, Biennial Conference on Chemical Education, Ann Arbor, MI July 19, 2000, Catalytic Activation of Hydrogen Peroxide for Environmentally Significant Problems, **GORDON CONFERENCE** on Green Chemistry, (Moderator of this conference for the Gordon Conference Trustees), New London, CT
394. July 11, 2000, Sustaining a High Technology Civilization, Public Lecture 7:30–9:00 pm, Dunedin Public Library, Dunedin, New Zealand
395. July 2–6, 2000, SCICON Conference of New Zealand Science Educators, 90 MINUTE WORKSHOP, Green Chemistry: On the Responsibility of Chemists to Promote Sustainability, June 5, Massey University, Palmerston North,

- New Zealand
396. July 2–6, 2000, SCICON Conference of New Zealand Science Educators, **PLENARY LECTURE**, Sustaining a High Technology Civilization, June 4, Massey University, Palmerston North, New Zealand
 397. July 4, 2000, Sustaining a High Technology Civilization, The Royal Society of New Zealand, The Science Museum, Palmerston North, New Zealand
 398. June 29, 2000, Sustaining a High Technology Civilization, Public Lecture 7:30–9:00 pm, University of Auckland, Auckland, New Zealand
 399. April 20, 2000, Green Chemistry and Sustainability, Environmental Club, Carnegie Mellon University, Pittsburgh, PA
 400. March 28, 2000, Catalytic peroxide activation: Pulp bleaching, color and AOX abatement, 219th ACS National Meeting March 26-30, 2000, San Francisco, CA
 401. February 22, 2000, The Design of Green Oxidation Systems, Department of Chemistry, University of Michigan, Ann Arbor, MI
 402. February 16, 2000, The Design of Green Oxidation Systems, Synthetic Organic Chemical Manufacturers Association Annual Conference, New Orleans, LA
 403. January 28, 2000, The Design of Green Oxidation Systems, Department of Chemistry, Youngstown State University, Youngstown, OH
 404. January 12, 2000, The Design of Peroxide-Activating Catalysts, Unilever Research Headquarters, Port Sunlight, England
 405. November 19, 1999, The Design of Green Oxidation Systems, Department of Chemistry, Virginia Polytechnical University, Blacksburg, VA
 406. November 18, 1999, Green Chemistry: Sustaining a High Technology Civilization, Washington and Lee University, Lexington, VA
 407. November 2, 1999, Catalysis is a Key to a Better Future for the Pulp and Paper Industry, TAPPI Pulping Conference, Renaissance Orlando, Orlando, FL
 408. October 26, 1999, Green Chemistry: Sustaining a High Technology Civilization, Pittsburgh Chemist's Club, Durantes Restaurant, Pittsburgh, PA
 409. October 16, 1999, Green Chemistry: Sustaining a High Technology Civilization, Carnegie Mellon Parents Day, Carnegie Mellon University, Pittsburgh, PA
 410. October 15, 1999, Green Chemistry: Sustaining a High Technology Civilization, Allegheny Erie Society of Toxicology, Moon, PA
 411. September 30, 1999, The Design of Green Oxidation Systems, Department of Chemistry and Biochemistry University of Pennsylvania, Philadelphia, PA
 412. September 29, 1999, The Design of Green Oxidation Systems, Rohm and Haas Corporation, Springhouse, PA
 413. September 23, 1999, Green Chemistry: Sustaining a High Technology Civilization, Central Catholic High School, Pittsburgh, PA
 414. September 13, 1999, The Design of Green Oxidation Systems, Department of Biochemistry, University of Wisconsin, Madison, WI
 415. September 8, 1999, The Design of Chemistry Labs of the 21st Century, Meeting of Architectural Firms and Govt. Agencies, Boston MA
 416. August 12, 1999, The Design of Sustainable Oxidation Systems, GSF Research Center of München, Ingolstadter Landstr.1, 85764 Neuherberg, Germany
 417. July 23, 1999, Green Chemistry: Sustaining a High Technology Civilization, Pennsylvania Governor's Science Institute, **PLENARY LECTURE**, Carnegie Mellon University, Pittsburgh, PA
 418. July 1, 1999, The Seven Promises of Catalysis in the Pulp and Paper Industry, Green Chemistry and Engineering Conference, National Academy of Sciences, Washington, DC
 419. April 26, 1999, The Seven Promises of Catalysis in the Pulp and Paper Industry, Lecture to the Bleaching Committee of TAPPI, Hattiesburg MS
 420. April 22, 1999, The Design of Green Oxidants, To the Chemistry Teachers of Pittsburgh and their most gifted students, Central Catholic High School, Pittsburgh, PA
 421. January 28, 1999, The Design of Green Oxidants, **GORDON CONFERENCE** on Metals in Biology, This 2 hour lecture was the Thursday evening after diner speech that both closed the Metals in Biology Gordon Conference and opened the young scientist Gordon Conference on Metals in Biology
 422. January 25, 1999, Green Up or Clean Up: The Design of Green Oxidants, Conference on Organometallic Chemistry in the South Pacific to honor Warren Roper on the occasion of his 60th birthday, Auckland, New Zealand
 423. November 5, 1998, The Design of Green Oxidants, University of Vermont, Burlington, VT
 424. October 28, 1998, New Efficient, Selective, Totally Chlorine Free Wood Pulp Bleaching Technology, 1998 TAPPI Pulp Conference, Montreal, Canada
 425. October 23-25, 1998, Green Chemistry: Sustaining a High Technology Civilization, EPA/NSF Green Chemistry Education Kick-off Meeting, National Academy of Sciences, Washington, DC
 426. October 20, 1998, The Design of Green Oxidants, Unilever Research, Port Sunlight, England
 427. August 25, 1998, New, Selective, Efficient, Totally Chlorine-Free Wood Pulp Bleaching Technology, Symposium to Honor Career of Daryle Busch (Current President-Elect of ACS), 216th ACS Meeting, Boston, MA

428. August 23, 1998, Green Chemistry Education, Green Chemistry Education: International Perspectives, ACS Symposium, ACS Meeting, Boston, MA
429. July 28, 1998, Green Chemistry: Sustaining a High Technology Civilization, **THE PLENARY LECTURER** to Gifted High School Students of Osaka at symposium on Green Earth Science, Osaka-City University, Osaka, Japan
430. July 27, 1998, The Design of Green Oxidants, Department of Material Science Osaka-City University, Osaka, Japan
431. July 25, 1998, The Design of Green Oxidants, **THE PLENARY LECTURER** 5th International Symposium of the Society Of Pure And Applied Coordination Chemistry of Japan, "Molecular Design of Functional Metal Complexes for Green Earth Science", Kogakuin University, Tokyo Japan, July 25, **AWARD LECTURE** for the 1997 Prize of Society of Pure And Applied Coordination Chemistry of Japan
432. July 22, 1998, The Design of Green Oxidants, **GORDON CONFERENCE** on Inorganic Chemistry, Salve Regina College, Newport, RI
433. July 1, 1998, The Design of Green Oxidants, Green Chemistry and Engineering Conference, National Academy of Sciences, Washington, DC
434. June 12, 1998, The Design of Green Oxidants, NSF Inorganometallic Workshop, Knoxville, TN
435. May 12, 1998, Development of Long-Lived Hydrogen Peroxide Activators for Pulp Bleaching, Annual Spring Meeting of the Pulp Bleaching Committee of the Association of The Pulp and paper Industry, Wisconsin Rapids, WI
436. January 30, 1998, The Design of Green Oxidants, **KEYNOTE LECTURE**, Annual Meeting of the Chemistry Department Heads and Full Professors of Australia, Canberra, Australia
437. September 30, 1997, "The Development of Green Oxidants": **PLENARY LECTURE**, International Conference on Green Chemistry: Challenging Perspectives, Venice, Italy
438. June 23, 1997, "The Development of Green Oxidants": **PLENARY LECTURE**, 1997 Green Chemistry and Engineering Conference, Implementing Vision 2020 for the Environment, National Academy of Sciences, Washington, DC
439. 1996, Designing Ligands for Oxidizing Complexes, Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA
440. November 6, 1996, Academy of Life-Long Learning, Carnegie Mellon University, Pittsburgh, PA
441. September 3, 1996, The Design of Green Oxidants, Department of Chemistry, Victoria University, Wellington, New Zealand
442. September 3, 1996, Ligand-Design Based Approaches for Controlling Exchange Coupling, Department of Chemistry, Victoria University, Wellington, New Zealand
443. July 29–August 30, 1996 Ten lectures, Distinguished Visitor, Department of Chemistry, University of Auckland, Auckland New Zealand
444. August 14, 1996, Distinguished Scientist Seminar, Department of Chemistry, University of Auckland, Auckland New Zealand
445. July 27, 1996, Invited speaker at the First **GORDON CONFERENCE** on Environmentally Benign Organic Chemistry, New England College, Henniker, NH
446. August 7, 1996, Distinguished Scientist Seminar, Department of Chemistry, University of Auckland, Auckland New Zealand
447. March 27, 1996, Massachusetts Institute of Technology, Boston, MA
448. March 17, 1996, North Carolina State University, Raleigh, NC
449. January 30, 1996, International Meeting on Macrocyclic Chemistry, Wellington, New Zealand
450. September 17, 1995, NATO Workshop, *Magnetism: A Supramolecular Function*, Carcans, France
451. June 27, 1995, First Midwest Meeting in Bioinorganic Chemistry Meeting, Minneapolis, MN
452. May 25, 1995, Clorox Chemical Company, Pleasanton, CA
453. May 24, 1995, Electrochemical Society International Meeting, Reno, NV
454. February 24, 1995, Hamilton College, Clinton, NY
455. February 8, 1995, University of Delaware, Newark, DE
456. July 1994, Industrial and Government visitors to the Environmental Open House, Carnegie Mellon University, Pittsburgh, PA
457. September 15, 1994, University of Vermont, Burlington, VT
458. August 2, 1994, 13th Biennial Conference on Chemical Education, Bucknell University, Lewisburg, PA
459. July 13, 1994, EPA Workshop on Green Design, Cincinnati, OH
460. Jan 19, 1994, Air Products Corporation, Allentown, PA
461. October 15, 1993, Baylor University, Waco, TX
462. October 13, 1993, University of Texas, Austin, TX
463. September 30, 1993, Columbia University, New York, NY
464. September 29, 1993, Princeton University, Princeton, NJ
465. September 28, 1993, University of Pennsylvania, Philadelphia, PA
466. March 5, 1993, University of Kansas, Lawrence, KS
467. March 4, 1993, Kansas State University, Manhattan, KS

468. February 26, 1993, ARCO Chemical Company, MD
469. January 19, 1993, Air Products, Allentown, PA
470. October 15, 1992, Gettysburg College, Gettysburg, PA
471. October 1, 1992, Rensselaer Polytechnic Institute, Troy, NY
472. May 7-8, 1992 – Participant in NSF National Workshop on the teaching of Chemistry in Undergraduate Laboratories, Washington, DC
473. April 27, 1992 – ARCO Chemical Company, MA
474. April 8, 1992 – Invited speaker in the Symposium on New Reagents in Inorganic and Organometallic Chemistry, National ACS Meeting, San Francisco, CA
475. November 11, 1991 – Departmental Colloquium, University of Chicago, Chicago, IL
476. October 1, 1991 – Yale University, New Haven, CT
477. April 18, 1991 – Inorganic seminar to faculty and students of University of Akron, Kent State University, Mt. Union College, and several other colleges, Kent, OH
478. March 28, 1991 – Indiana University, Bloomington, IN
479. March 1, 1991 – ARCO Chemical Company, MD
480. February 1, 1991 – **PLENARY LECTURE**, International Conference on Inorganic Chemistry, University of Waikato, Hamilton, New Zealand
481. August, 27 1990 – National ACS Conference – Symposium on "Ligand Design in Regulating Redox Reactions", Washington, DC
482. April 19, 1990, Pittsburgh/Cleveland Catalysis Soc., Cleveland, OH
483. April 17, 1990 – Pennsylvania State University, College Station, PA
484. †April 27, 1990: Seminar on *ITEC* to Pennsylvania High School and College Teachers at the University of Pittsburgh, Pittsburgh, PA
485. †April 6, 1990 – Seminar on *ITEC* to Pennsylvania Science Educ. Soc. Allegheny College, Meadville, PA
486. †January 11, 1990 – Education Directorate Officers, NSF, Washington, DC
487. December 6, 1989 – University of Delaware, Newark, DE
488. October 24, 1989 – University of Maryland, College Park, MD
489. October 6, 1989 – Duquesne University, Pittsburgh, PA
490. November 18, 1988 – Santa Clara University, Santa Clara, CA
491. †October 11, 1989 – Lord Corporation and Foundation Executives, Pittsburgh, PA
492. †July 26, 1989 – Pittsburgh High School Teachers, Pittsburgh, PA
493. †May 24, 1989 – Presentation to Merck Representatives at CMU (leading ultimately to Corporate Grant), Pittsburgh, PA
494. †May 22, 1989 – Select Group of CMU Trustees, Pittsburgh, PA
495. †March 21, 1989 – International Conference on Global Crises, Chicago, IL
496. November 10, 1988 – W. R. Grace Company, MD
497. October 27, 1988 – Clemsen University, Clemsen, SC
498. October 4, 1988 – Mellon College of Science Research Seminar, Pittsburgh, PA
499. †September 19, 1988, Duquesne University Presentation to High School Teachers, Pittsburgh, PA
500. †July 21 1988, The Chemical Manufacturers Association, The National Science Foundation, The American Chemical Society, Washington, DC
501. †June 28, 1988, The Mobay Corporation Administration, Pittsburgh, PA
502. †May 18, 1988, The Kresge Foundation, Detroit, MI
503. †May 11, 1988, Calgon Carbon Company, Pittsburgh, PA
504. April 20, 1988 – Bucknell University, Lewisburg, PA
505. April 7, 1988 – Kent State University, Kent, OH
506. †April 4, 1988, The Duquesne Club presentation to Pittsburgh Corporate Executives (leading ultimately to Corporate Grant), Pittsburgh, PA
507. †March 29, 1988, The Dreyfus Foundation, New York, NY
508. March 23, 1988 – The University West Virginia, Morgantown, WV
509. February 11, 1988 – The University of Pittsburgh, Pittsburgh, PA
510. December 4 1987 – Baylor University, Waco, TX
511. January 1987 – Standard Oil, Cleveland, OH
512. January 1987 – The University of Southern California, Los Angeles CA
513. November 20, 1986 – Carnegie Mellon University, Pittsburgh, PA
514. November 14, 1986 – Amoco Chemical Company, Chicago, IL
515. November 4, 1986 – Dow Chemical Company, Midland, MI
516. November 3, 1986 – Dow Chemical Company, Midland, MI
517. October 7, 1986 – University of Southern California, Los Angeles, CA
518. September, 1986 – University of Nebraska, Lincoln, NE
519. February 25–27, 1986 – Organizer of and speaker in the Industrial Associates Conference on Oxidation Chemistry held

- at Caltech, Pasadena, CA
520. December 4, 1985 – Simon Fraser University, Burnaby, British Columbia, Canada
521. December 3, 1985 – Departmental Seminar at the University of British Columbia, Vancouver, British Columbia, Canada
522. December 2, 1985 – University of Washington, Seattle, WA
523. November 22, 1985 – University of California, Berkeley, Berkeley, CA
524. November 20, 1985 – University of California, Davis, Davis, CA
525. November 19, 1985 – Stanford University, Stanford, CA
526. November 16, 1985 – Northwestern University, Evanston, IL
527. November 15, 1985 – Northwestern University, Evanston, IL
528. November 14, 1985 – Hope College, Holland, MI
529. November 12–13, 1985 – University of Illinois, Champaign–Urbana, IL
530. November 11, 1985 – SOHIO, Cleveland, OH
531. November 6, 1985 – University of Chicago, Chicago, IL
532. October 24, 1985 – Carleton College, Northfield, MN
533. October 23, 1985 – 3M Company, St. Paul, MN
534. October 22, 1985 – ACS Inorganic Topical Group Seminar, University of Minnesota, St. Paul, MN
535. October 21, 1985 – University of Wisconsin, Madison, Madison, WI
536. October 17, 1985 – Ohio State University, Columbus, OH
537. October 16, 1985 – Iowa State University, Ames, IA
538. October 15, 1985 – University of Iowa, Iowa City, IA
539. October 14, 1985 – Washington University, St. Louis, MO
540. October 10–11, 1985 – Invited speaker in Symposium on Oxidation Chemistry at Monsanto Company, St. Louis, MO
541. July 29–August 2, 1985 – Invited speaker at the Organometallic **GORDON CONFERENCE**, Hawthorne College, Antrim, NH
542. June 10–12, 1985 – Invited speaker in Symposium on Unusual Oxidation States at the ACS Regional Meeting, Purdue University, West Lafayette, IN
543. May 24, 1985 – Harvard/MIT joint seminar in Inorganic Chemistry, Cambridge, MA
544. May 21, 1985 – University of California, Los Angeles, Los Angeles, CA
545. May 17, 1985 – Exxon Research and Engineering Company, Annandale, NJ
546. May 15, 1985 – GTE Laboratories, Waltham, MA
547. May 14, 1985 – Texaco Inc., Beacon Hill, NY
548. May 13, 1985 – Air Products and Chemicals, Inc., Allentown, PA
549. April 22–26, 1985 – Invited speaker at the US/USSR Symposium on Environmentally Related Catalysis, Moscow, USSR
550. April 19, 1985 – Rohm and Haas Company, Spring House, PA
551. April 18, 1985 – Columbia University, New York, NY
552. January 24, 1985 – Departmental Seminar, Harvey Mudd College, Claremont, CA
553. October 26, 1984 – University of California, Santa Barbara, Santa Barbara, CA
554. December 16–21, 1984 – 1984 International Chemical Congress of Pacific Basin Societies, (One of the organizers of and speakers in the Symposium on "New Developments in Coordination Chemistry: Oxygen and Oxidation"), Honolulu, HI
555. September 24–28, 1984 – Invited participant at the Fourth International Symposium on Homogeneous Catalysis, Leningrad, USSR
556. July 9, 1984 – Cambridge University, Cambridge, England
557. July 5, 1984 – Oxford University, Oxford, England
558. June 24–29, 1984 – Member of the International Advisory Committee and speaker in the International Oxidations", Padova, Italy Symposium and Advanced Research Workshop on "Activation of Dioxygen Species and Homogeneous Catalytic Oxidation Chemistry"; Report Editor
559. June 8, 1984 – Rohm and Haas Company, Spring House, PA
560. June 6, 1984 – Invited speaker at the symposium entitled "Advances in Catalytic Science – New Eyes/New Insights," University of Delaware, Newark, Delaware and participant in the annual review meeting of the Center for Catalytic Science and Technology, DE
561. June 4, 1984 – E. I. du Pont de Nemours and Company, Wilmington, DE
562. May 30–June 2, 1984 – Invited speaker at the 1984 National Science Foundation Organometallic Chemistry Workshop, The University of North Carolina, Chapel Hill, NC
563. May 29, 1984 – Dow Chemical Company, Midland, MI
564. May, 1984 – University of California, San Diego, La Jolla, CA
565. April 17, 1984 – University of Southern California, Los Angeles, CA
566. April 8–12, 1984 – Invited speaker in Symposium on Carbon Dioxide Chemistry at the 187th National ACS Meeting, St. Louis, MO

- 567. March 15, 1984 – University of California, Irvine, Irvine, CA
- 568. August 8–12, 1983 – Invited speaker at the 1983 Inorganic Chemistry **GORDON CONFERENCE**, (Brewster Academy), Wolfeboro, NH
- 569. April 15, 1983 – California State University, Northridge, Northridge, CA
- 570. March 20–25, 1983 – Session Chairman, 185th National ACS Meeting, Seattle, WA
- 571. March 20–25, 1983 – 185th National ACS Meeting, Seattle, WA
- 572. March 16–18, 1983 – Invited speaker at the Conference on Frontiers of Catalysis, California Institute of Technology, 22 Gates, Pasadena, CA
- 573. February 28, 1983 – Loma Linda University, La Sierra Campus, Loma Linda, CA
- 574. June 23–26, 1981 – Invited speaker at the 1981 NSF National Organometallic Chemistry Workshop, Asilomar, Pacific Grove, CA