

# CURRICULUM VITAE

## THOMAS G. GRAY

### PROFESSIONAL ADDRESS

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### EDUCATION

Ph.D. 2002, Harvard University, Cambridge, Massachusetts (R. H. Holm, advisor)  
A.M. 2000, Harvard University, Cambridge, Massachusetts (R. H. Holm, advisor)  
B.S. *summa cum laude* 1996, Southern Methodist University, Dallas, Texas

### EXPERIENCE

Case Western Reserve University. Associate Professor of Chemistry (with tenure), 2010-present.  
Case Western Reserve University. Frank Hovorka Assistant Professor of Chemistry, 2007-2010.  
Case Western Reserve University. Assistant Professor of Chemistry, 2004-2007.  
Massachusetts Institute of Technology. Guest instructor, 5.04, Inorganic Chemistry II, Fall 2003  
Massachusetts Institute of Technology. Postdoctoral Fellow, Department of Chemistry, 2002-2004 (D. G. Nocera, advisor)  
Harvard University. Teaching Fellow in Advanced Inorganic Chemistry, Fall 2001  
American Red Cross certification in C.P.R., 1997-2001, and first aid, 1997-2002  
Harvard University. Safety Officer of the Holm research group, 1997-2002  
Harvard University. Teaching Fellow in Inorganic Chemistry, Spring 1997  
Harvard University. Teaching Fellow in Advanced Inorganic Chemistry, Fall 1996  
Southern Methodist University. Undergraduate research participant, 1993-1996  
(J. A. Maguire, advisor)  
Southern Methodist University. Treasurer, SMU Chemistry Society, 1995-1996  
Southern Methodist University. Director of Grammar School Science Demonstrations, SMU Chemistry Society 1994-1996

## HONORS

Alfred P. Sloan Research Fellow, 2009–2011  
National Institutes of Health Postdoctoral Fellow, 2002-2003  
National Science Foundation Fellow, 1997-2000 (Harvard University)  
Graduated first in class, Dedman College, Southern Methodist University, 1996  
University Outstanding Scholar Award, 1996 (SMU)  
John K. Godbey Outstanding Senior Scientist Award, 1996 (SMU)  
Dr. Pepper/Lazenby Award for Excellence in Chemistry, 1996 (SMU)  
Chemistry Department Citizenship Award, 1996 (SMU)  
Alpha Tau Omega National Freshman Honor Society Award, 1996  
Phi Beta Kappa, 1995-present (elected during the junior year)  
Golden Key National Honor Society, 1995  
Barry M. Goldwater Excellence in Education Fellowship, 1994-1996  
Harold Jeskey Scholarship, 1993-1994; 1994-1995 (SMU)  
Freshman Chemistry Award, 1993 (SMU)  
Alpha Tau Omega National Freshman Honor Society, 1992-1996  
University Scholar, 1992-1996 (SMU)  
National Merit Scholar, 1992-1996

## PEER-REVIEWED GRANTS (Gray is sole P.I. on all.)

A.C.S. Petroleum Research Fund Type G, “Bridging Biology and Nanochemistry: Metalloclusters as Bioimaging Agents and Biomineralization Scaffolds,” \$35,000.00. September 1, 2006 – August 31, 2007.

National Science Foundation, “Luminactive Gold Complexes: Synthesis and Photophysics,” \$375,000. April 1, 2008 – March 31, 2011.

## PUBLICATIONS

1. “Structural Distortions in Main-Group Metallocarboranes,” Maguire, J. A.; Hosmane, N. S.; Saxena, A. K.; Zhang, H.; **Gray, T. G.** *Phosphorus and Sulfur* **1994**, 87, 129-137.
2. “Chemistry of C-Trimethylsilyl-Substituted Heterocarboranes. 18. Synthetic, Spectroscopic, Reactivity, and Bonding Studies on the Group 13 Element Metallocarboranes: Crystal Structures of 1-(CMe<sub>3</sub>)-1-Ga(2,2'-C<sub>10</sub>H<sub>8</sub>N<sub>2</sub>)-2,3-(SiMe<sub>3</sub>)<sub>2</sub>-2,3-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub>, 1-(CMe<sub>3</sub>)-1-Ga(L)-2,4-(SiMe<sub>3</sub>)<sub>2</sub>-2,4-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub> [L = 2,2'-C<sub>10</sub>H<sub>8</sub>N<sub>2</sub>, 2,2'-C<sub>8</sub>H<sub>6</sub>N<sub>4</sub>], *closo*-1-(Me<sub>2</sub>CH)-1-In-2,4-(SiMe<sub>3</sub>)<sub>2</sub>-2,4-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub>, and 1-(Me<sub>2</sub>CH)-1-In(2,2'-C<sub>10</sub>H<sub>8</sub>N<sub>2</sub>)-2,4-(SiMe<sub>3</sub>)<sub>2</sub>-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub>,” Hosmane, N. S.; Saxena, A. K.; Lu, K.-J.; Maguire, J. A.; Zhang, H.; Wang, Y.; Thomas, C. J.; Zhu, D.; Grover, B.; **Gray, T. G.**; Eintracht, J. F. *Organometallics* **1995**, 14, 5104-5118.

3. “Magnesium Alkyls as Metalating Reagents in the Formation of Novel Half- and Full-Sandwich Magnesacarboranes,” Hosmane, N. S.; Zhu, D.; McDonald, J. E.; Zhang, H.; Maguire, J. A.; **Gray, T. G.**; Helfert, S. C. *J. Am. Chem. Soc.* **1995** *117*, 12362-12363.
4. “Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 20. Synthetic and Structural Studies of Sandwich Ln(III) Carborane Clusters. II (Ln(III) = Sm, Gd, Dy, Ho, Er),” Hosmane, N. S.; Wang, Y.; Zhang, H.; Maguire, J. A.; McInnis, M.; **Gray, T. G.**; Collins, J. D.; Kremer, R. K.; Binder, H.; Waldhör, E.; Kaim, W. *Organometallics* **1996**, *15*, 1006-1013.
5. “Electron-Acceptor Behavior of 1,4,7,9-Tetracarba-*nido*-dodecaborane(12) with Group 1 and Group 2 Metals: Syntheses and Crystal Structures of [(THF)<sub>4</sub>Li][(SiMe<sub>3</sub>)<sub>4</sub>C<sub>4</sub>B<sub>8</sub>H<sub>9</sub>] and [(THF)<sub>2</sub>Mg(SiMe<sub>3</sub>)<sub>4</sub>C<sub>4</sub>B<sub>8</sub>H<sub>8</sub>],” Hosmane, N. S.; Zhang, H.; Wang, Y.; Lu, K.-J.; Thomas, C. J.; Ezhova, M. B.; Helfert, S. C.; Collins, J. D.; Maguire, J. A.; **Gray, T. G.**; Baumann, F.; Kaim, W. *Organometallics* **1996**, *15*, 2425-2427.
6. “The First Carborane with a Distorted Cuboctahedral Structure,” Hosmane, N. S.; Zhang, H.; Maguire, J. A.; Wang, Y.; Thomas, C. J.; **Gray, T. G.** *Angew. Chem., Int. Ed. Engl.* **1996**, *35*, 1000-1001; *Angew. Chem.* **1996**, *108*, 1093-1095.
7. “Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 21. Syntheses, Structures, EPR Spectra, and Reactivities of Bent-Sandwich and Half-Sandwich Titanacarboranes. Full Analysis of Spin-Spin Coupling in Two Structurally Characterized Titanium(III)-Carborane Dimers,” Hosmane, N. S.; Wang, Y.; Zhang, H.; Lu, K.-J.; Maguire, J. A.; **Gray, T. G.**; Brooks, K. A.; Waldhör, E.; Kaim, W.; Kremer, R. K. *Organometallics* **1997**, *16*, 1365-1377.
8. “Thermal Conversion of *closo*-1,2-(SiMe<sub>3</sub>)<sub>2</sub>-1,2-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub> to *closo*-1,6-(SiMe<sub>3</sub>)<sub>2</sub>-1,6-C<sub>2</sub>B<sub>4</sub>H<sub>4</sub>: Structure Determination by Ab Initio Calculations, Gas-phase Electron Diffraction, and Low-Temperature X-ray Diffraction,” Maguire, J. A.; Lu, K.-J.; Thomas, C. J.; **Gray, T. G.**; Wang, Y.; Eintracht, J. F.; Hosmane, N. S.; Binder, H.; Wanitschek, M.; Borrmann, H.; Simon, A.; Oberhammer, H. *Chem. Eur. J.* **1997**, *3*, 1059-1063.
9. “Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 23. Synthetic, Structural, and Spectroscopic Investigation on Half- and Full-Sandwich Magnesacarboranes of 2,3- and 2,4-C<sub>2</sub>B<sub>4</sub> Carborane Ligands,” Hosmane, N. S.; Zhu, D.; MacDonald, J. E.; Zhang, H.; Maguire, J. A.; **Gray, T. G.**; Helfert, S. C. *Organometallics* **1998**, *17*, 1426-1437.
10. “Chemistry of *C*-Trimethylsilyl-Substituted Heterocarboranes. 26. Further Investigation of the Oxidative Cage Closure, Cage Fusion, and Cage Isomerizations: Synthetic, Structural, and Bonding Studies on ‘Carbons Adjacent’ and ‘Carbons Apart’ Tetracarba-*nido*-dodecaborane(12) Derivatives,” Hosmane, N. S.; Colacot, T. J.; Zhang, H.; Yang, J.; Maguire, J. A.; Wang, Y.; Ezhova, M. B.; Franken, A.; Demissie, T.; Lu, K.-J.; Zhu, D.; Thomas, J. L. C.; Collins, J. D.; **Gray, T. G.**; Hosmane, S. N.; Lipscomb, W. N. *Organometallics* **1998**, *17*, 5294-5309.

11. "Crystal structure of 4,4-dimethyloxazolidine-2-thione, C<sub>5</sub>H<sub>9</sub>NOS," **Gray, T.**; Laplaza, C. E.; Staples, R. J. *Z. Kristallogr.* **1999**, *214*(2), 230.
12. "Synthesis and Structures of Solvated Monoclusters and Bridged Di- and Triclusters Based on the Cubic Building Block [Re<sub>6</sub>(μ<sub>3</sub>-Se)<sub>8</sub>]<sup>2+</sup>," Zheng, Z.; **Gray, T. G.**; Holm, R. H. *Inorg. Chem.* **1999**, *38*, 4888-4895.
13. "Highly Emissive Hexanuclear Rhenium(III) Clusters Containing the Cubic Cores [Re<sub>6</sub>S<sub>8</sub>]<sup>2+</sup> and [Re<sub>6</sub>Se<sub>8</sub>]<sup>2+</sup>," **Gray, T. G.**; Rudzinski, C. M.; Nocera, D. G.; Holm, R. H. *Inorg. Chem.* **1999**, *38*, 5932-5933.
14. "Chemistry of C-Trimethylsilyl-Substituted Heterocarboranes. 28. Selective Alkylation and Reactivity of "Carbons Adjacent" and "Carbons Apart" Tetracarba-nido-dodecaborane(12) Derivatives toward Group 1 and Group 2 Metals. Synthetic, Spectroscopic, and Structural Investigations on Lithium-, Sodium-, Potassium-, Cesium-, and Magnesium-Complexed C<sub>4</sub>B<sub>8</sub> Carboranes," Hosmane, N. S.; Zhang, H.; Maguire, J. A.; Wang, Y.; Demissie, T.; Colacot, T. J.; Ezhova, M. B.; Lu, K.-J.; Zhu, D.; **Gray, T. G.**; Helfert, S. C.; Hosmane, S. N.; Collins, J. D.; Baumann, F.; Kaim, W.; Lipscomb, W. N. *Organometallics* **2000**, *19*, 497-508.
15. "Bridged Multiclusters Derived from the Face-Capped Octahedral [Re<sub>6</sub><sup>III</sup>(μ<sub>3</sub>-Se)<sub>8</sub>]<sup>2+</sup> Cluster Core," Selby, H. D.; Zheng, Z.; **Gray, T. G.**; Holm, R. H. *Inorg. Chim. Acta* **2001**, *312*, 205-209.
16. "Site-Differentiated Hexanuclear Rhenium(III) Cyanide Clusters [Re<sub>6</sub>Se<sub>8</sub>(PET<sub>3</sub>)<sub>n</sub>(CN)<sub>6-n</sub>]<sup>n-4</sup> (n = 4, 5) and Kinetics of Solvate Ligand Exchange on the Cubic [Re<sub>6</sub>Se<sub>8</sub>]<sup>2+</sup> Core," **Gray, T. G.**; Holm, R. H. *Inorg. Chem.* **2002**, *41*, 4211-4216.
17. "A Combined Experimental and Theoretical Investigation of Excited-State Attributes of Hexanuclear Rhenium Chalcogenide Clusters," **Gray, T. G.**; Rudzinski, C. M.; Meyer, E. E.; Holm, R. H.; Nocera, D. G. *J. Am. Chem. Soc.* **2003**, *125*, 4755-4770.
18. "Hexanuclear and Higher Nuclearity Clusters of the Groups 4–7 Metals with Stabilizing π-Donor Ligands," **Gray, T. G.** *Coord. Chem. Rev.* **2003**, *243*, 213-235.
19. "Synthesis, Structure, and CO<sub>2</sub>-Reactivity of a Two-Coordinate (Carbene)copper(I)-Methyl Complex," Mankad, N.; **Gray, T. G.**; Laitar, D. S.; Sadighi, J. P. *Organometallics*, **2004**, *23*, 1191-1193.
20. "Excited-State Distortion of Rhenium(III) Sulfide and Selenide Clusters," **Gray, T. G.**; Rudzinski, C. M.; Meyer, E. E.; Nocera, D. G. *J. Phys. Chem. A* **2004**, *108*, 3238-3243.
21. "Cooperative Bimetallic Reactivity: Hydrogen Activation in Two-Electron Mixed-Valence Compounds," **Gray, T. G.**; Veige, A. S.; Nocera, D. G. *J. Am. Chem. Soc.* **2004**, *126*, 9670-9678.

22. “Hydrogenation of Two-Electron Mixed-Valence Iridium Alkyl Complexes,” Veige, A. S.; **Gray, T. G.**; Nocera, D. G. *Inorg. Chem.* **2005**, *44*, 17-26.
23. “Heterobimetallic Main Group-Transition Metal Paddle-Wheel Carboxylates,” Dikarev, E. V.; **Gray, T. G.**; Li, B. *Angew. Chem., Int. Ed.* **2005**, *44*, 1721-1724.
24. “Chemistry of C-Trimethylsilyl-Substituted Heterocarboranes. 31. New Insights into Reaction Pathways of Carborane Ligand Systems: Synthetic, Structural, Spectroscopic, and Electrochemical Studies on Sandwich and Half-Sandwich Metallocarboranes of Iron, Cobalt, and Nickel,” Tomlinson, S.; Zheng, C.; Hosmane, N. S.; Yang, J.; Wang, Y.; Zhang, H.; **Gray, T. G.**; Demissie, T.; Maguire, J. A.; Baumann, F.; Klein, A.; Sarker, B.; Kaim, W.; Lipscomb, W. N. *Organometallics* **2005**, *24*, 2177-2187.
25. “A model for two-electron mixed valence in metal-metal bonded dirhodium compounds,” **Gray, T. G.**; Nocera, D. G. *Chem. Commun.* **2005**, 1540-1542.
26. “Oxygen and hydrogen photocatalysis by two-electron mixed-valence coordination compounds,” Rosenthal, J.; Bachman, J.; Dempsey, J. L.; Esswein, A. J.; **Gray, T. G.**; Hodgkiss, J. M.; Manke, D. R.; Luckett, T. D.; Pistorio, B. J.; Veige, A. S.; Nocera, D. G. *Coord. Chem. Rev.* **2005**, *249*, 1316-1326.
27. “A Carbene-Stabilized Gold(I) Fluoride: Synthesis and Theory,” Laitar, D. S.; Müller, P.; **Gray, T. G.**; Sadighi, J. P. *Organometallics* **2005**, *24*, 4503-4505.
28. “Carbon-Gold Bond Formation through [3 + 2] Cycloaddition Reactions of Gold(I) Azides and Terminal Alkynes,” Partyka, D. V.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2007**, *26*, 183-186.
29. “Relativistic Functional Groups: Aryl Carbon-Gold Bond Formation by Selective Transmetalation of Boronic Acids,” Partyka, D. V.; Zeller, M.; Hunter, A. G.; **Gray, T. G.** *Angew. Chem., Int. Ed.* **2006**, *45*, 8188-8191; *Angew. Chem.* **2006**, *118*, 8368-8371.
30. “Bis(tetraphenylphosphonium) Octa( $\mu_3$ -chloro)hexakis(trifluoromethanesulfonato) octahydrohexamolybdate (2-) Dichloromethane/diethyletherate,” Peay, M.; Updegraff, J. III; **Gray, T. G.** *Acta Cryst. E* **2006**, *62*, m2895-m2897.
31. “Gold(I) Pyrenyls: Excited-State Consequences of Carbon-Gold Bond Formation,” Partyka, D. V.; Esswein, A. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2007**, *26*, 3279-3282.
32. “Luminescent, Three-Coordinate Azadipyrromethene Complexes of  $d^{10}$  Copper, Silver, and Gold,” Teets, T. S.; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Inorg. Chem.* **2007**, *46*, 6218-6220.

33. “Gilded Organometallics,” **Gray, T. G.** *Comments Inorg. Chem.* **2007**, *28*, 181–212 (invited review article).
34. “Dialkylbiarylphosphine complexes of Gold(I) Halides. Gold-aryl  $\pi$ -Interactions in the Solid State,” Partyka, D. V.; Robilotto, T. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2008**, *27*, 28–32.
35. “Homoleptic, Four-Coordinate Azadipyrromethene Complexes of  $d^{10}$  Zinc and Mercury,” Teets, T. S.; Partyka, D. V.; Updegraff, J. B. III; **Gray, T. G.** *Inorg. Chem.* **2008**, *47*, 2338–2346.
36. “A Convergent Approach to the Synthesis of Multimetallic Dithiolene Complexes,” Arumugam, K.; Yu, R.; Villágran, D.; **Gray, T. G.**; Mague, J. T.; Donahue, J. P. *Inorg. Chem.* **2008**, *47*, 5570–5572.
37. “A Porphyrin Complex of Gold(I): (Phosphine)gold(I) Azides as Cation Precursors,” Partyka, D. V.; Robilotto, T. J.; Zeller, M.; Hunter, A. D.; Gray, T. G. *Proc. Natl. Acad. Sci., U.S.A.* **2008**, *105*, 14293–14297.
38. “Facile Synthesis of Homoleptic Dialkylmercurials via Transmetallation of Arylboronic Acids,” Partyka, D. V.; Gray, T. G. *J. Organomet. Chem.* **2009**, *694*, 213–218.
39. “Facile Synthesis of (Phosphine-) and (*N*-heterocyclic Carbene)Gold(I) and Silver(I) Azide Complexes,” Partyka, D. V.; Robilotto, T. J.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2009**, *28*, 795–801.
40. “Divergent Electronic Structures of Isoelectronic Metalloclusters: Tungsten(II) Halides and Rhenium(III) Chalcogenide-Halides,” **Gray, T. G.** *Chem. Eur. J.* **2009**, *15*, 2581–2593.
41. “Probing the Steric Limits of Carbon-Gold Bond Formation: (Dialkylbiarylphosphine)gold(I) Aryls,” Partyka, D. V.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; Gray, T. G. *Organometallics* **2009**, *28*, 1666–1674.
42. “Synthesis, Crystal Structures, and Luminescence of New Alkynylgold(I) Complexes,” Gao, L.; Partyka, D. V.; Updegraff, J. B. III; Deligonul, N.; **Gray, T. G.** *Eur. J. Inorg. Chem.* **2009**, 2711–2719.
43. “Unusual Phosphorus-phosphorus Double Bond Contraction Upon Mono- and Di-Auration of a Diphosphene,” Partyka, D. V.; Washington, M. P.; **Gray, T. G.**; Updegraff, J. B. III; Turner, J. F., II; Protasiewicz, J. D. *J. Am. Chem. Soc.* **2009**, *128*, 10041–10048.
44. “Three-Coordinate, Phosphine-Ligated Azadipyrromethene Complexes of Univalent Group 11 Metals,” Teets, T. S.; Updegraff, J. B.; Esswein, A. J.; **Gray, T. G.** *Inorg. Chem.* **2009**, *48*, 8134–8144.

45. “Mono- and Di-Gold(I) Naphthalenes and Pyrenes: Synthesis, Crystal Structures, and Photophysics,” Gao, L.; Peay, M. A.; Partyka, D. V.; Updegraff, J. B. III; Teets, T. S.; Esswein, A. J.; Zeller, M.; Hunter, A. D.; **Gray, T. G.** *Organometallics* **2009**, *28*, 5669–5681.
46. “*fac*-Tricarbonyl Rhenium(I) Azadipyrromethene Complexes,” Partyka, D. V.; Deligonul, N.; Washington, M. P.; **Gray, T. G.** *Organometallics* **2009**, *28*, 5837–5840.
47. “Synthesis, Structures and Properties of 1,2,4,5-Benzenetetrathiolate Linked Group 10 Metal Complexes,” Arumugam, K.; Chandrasekaran, P.; Villagrán, D.; **Gray, T. G.**; Mague, J. T.; Donahue, J. P. *Inorg. Chem.* **2009** *48*, 10591–10607.
48. “Copper-Catalyzed Huisgen [3 + 2] Cycloaddition of Gold(I) Alkynyls with Benzyl Azide. Syntheses, Structures, and Optical Properties,” Partyka, D. V.; Gao, L.; Updegraff, J. B. III; Deligonul, N.; **Gray, T. G.** *Organometallics* **2009**, *28*, 6171–6182.
49. “Catalytic Aerobic Oxidation of PPh<sub>3</sub> by a Trianionic Pincer Cr<sup>III</sup>/Cr<sup>V</sup>O Couple,” O’Reilly, M.; Falkowski, J. M.; Ramachandran, V.; Pati, M.; Abboud, K. A.; Dalal, N. S.; **Gray, T. G.**; Veige, A. S. *Inorg. Chem.* **2009**, *48*, 10901–10903.
50. “Excited-State Dynamics of (Organophosphine)gold(I) Pyrene Isomers,” Vogt, R. A.; Peay, M. A.; **Gray, T. G.**; Crespo-Hernández, C. E. *J. Phys. Chem. Lett.* **2010**, *1*, 1205–1211.
51. “Gold(I) Halide Complexes of Bis(diphenylphosphine)diphenyl Ether Ligands: A Balance of Ligand Strain and Non-Covalent Interactions,” Partyka, D. V.; Updegraff, J. B. III; Zeller, M.; Hunter, A. D.; **Gray, T. G.**, *Dalton Trans.* **2010**, *39*, 5388–5397.

## CONFERENCE PRESENTATIONS

1. “Metallacarboranes of Lanthanides,” Wang, Y.; Oki, A. R.; Zhang, H.; **Gray, T. G.**; Maguire, J. A.; Hosmane, N. S. *Abstr. Pap. Am. Chem. Soc.* 209: 162-INOR Part 1 April 2, 1995.
2. “Controlled Aggregation and Electrochemistry of Hexanuclear Rhenium Clusters,” **Gray, T. G.**; Zheng, Z.; Holm, R. H. *Abstr. Pap. Am. Chem. Soc.* 216: 467-INOR August 25, 1998.
3. “Excited-State Attributes of Hexanuclear Rhenium(III) Chalcogenide Clusters,” **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 224: 303-INOR August 20, 2002.

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4. "Triplet-State Structure of Emitting Rhenium(III) Chalcogenide Clusters," **Gray, T. G.**; Nocera, D. G.; Rudzinski, C. M. Inorganic Chemistry Gordon Research Conference; July 13–18, 2003.
5. "Heterobimetallic Bismuth-Transition Metal Carboxylates," Li, B.; **Gray, T. G.**; Dikarev, E. V. *Abstr. Pap. Am. Chem. Soc.* 228: INOR-431 August 22–26, 2004.
6. "Carbon-Gold Bond Formation," **Gray, T. G.**; Partyka, D. V. Organometallic Chemistry Gordon Research Conference; July 9–14, 2006.
7. "Gilded Organometallics," **Gray, T. G.**; Partyka, D. V. Metals in Biology Gordon Research Conference; January 28–February 1, 2007.
8. "Relativistic Protons: Carbon-Gold Bond Formation," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 233: INOR-555 March 25–29, 2007.
9. "Metallocomplexes of Photoactive Ligands for Photodynamic Therapy," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 233: INOR-768 March 25–29, 2007.
10. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.** National Science Foundation Workshop in Inorganic Chemistry, June 4–7, 2007.
11. "Luminactive Gold Complexes: Synthesis and Photophysics," **Gray, T. G.**; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B., III; Gao, L.; Robilotto, T. J.; Peay, M. A. Organometallic Chemistry Gordon Research Conference; July 6–8, 2007.
12. "Metalla-azadipyrromethenes: Synthesis and Optical Properties," **Gray, T. G.**; Teets, T. S.; Partyka, D. V.; Esswein, A. J.; Updegraff, J. B., III Organometallic Chemistry Gordon Research Conference; July 6–8, 2007.
13. "Gold-Plated Fluorophores," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 234: INOR-800 August 19–23, 2007.
14. "Synthesis and Study of Multimetallic Complexes with Dithiolene, Bis(phosphine), and Diimine Connecting Ligands," Arumugam, K.; Chandrasekaran, P.; Shaw, M. C.; **Gray, T. G.**; Mague, J. T.; Donahue, J. P. *Abstr. Pap. Am. Chem. Soc.* 235: INOR-171 April 6–10, 2008.
15. "Gilded Organometallics: Synthesis and Excited-State Properties," **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 235: INOR-508 April 6–10, 2008.
16. "Synthesis of Multimetallic Mixed Dithiolene-phosphine Complexes," Donahue, J. P.; Arumugam, K.; Yu, R.; **Gray, T. G.**; Villágran, D.; Mague, J. T. *Abstr. Pap. Am. Chem. Soc.* 235: INOR-900 April 6–10, 2008.



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17. “Luminactive Gold Complexes: Synthesis and Photophysics,” **Gray, T. G.**; Partyka, D. V.; Teets, T. S.; Updegraff, J. B. III; Gao, L.; Robolitto, T. J.; Peay, M. A. Inorganic Chemistry Gordon Research Conference; July 13–17, 2008.
18. “Cycloaddition Reactions of Gold(I) Complexes,” **Gray, T. G.**; Partyka, D. V.; Robolitto, T. J.; Updegraff, J. B. III. Inorganic Chemistry Gordon Research Conference; July 13–17, 2008.
19. “Gilded Organometallics: Synthesis and Excited-State Properties,” **Gray, T. G.**; Partyka, D. V.; Teets, T. S.; Peay, M. A.; Robolitto, T. J.; Gao, L. *Abstr. Pap. Am. Chem. Soc.* 236: INOR-389 August 17–21, 2008.
20. “Biomedical Applications of Gold Containing Nucleosides: Development of a Dual Imaging and Therapeutic Agent,” Craig, S.; Motea, E.; Lee, I.; **Gray, T. G.**; Berdis, A. J., 21st Enzyme Mechanisms Conference Loews Ventana Canyon Resort Tucson, Arizona, January 3–6, 2009.
21. “Gold Adducts of Diphosphenes, Phospha-Wittig Reagents, and Phosphines ,” Partyka, D. V.; **Gray, T. G.**; Washington, M. P.; Updegraff, J. B.; Chen, X.; Incarvito, C. D.; Rheingold, A. D.; Protasiewicz, J. D. *Abstr. Pap. Am. Chem. Soc.* 237: INOR-431 March 22–26, 2009.
22. “Gilded Organometallics.” **Gray, T. G.** CERMACS, Central Regional Meeting of the American Chemical Society, May 21, 2009.
23. “Luminactive Gold Complexes: Synthesis and Photophysics,” **Gray, T. G.**; Partyka, D. V.; Gao, L.; Teets, T. S.; Robolitto, T. J.; Peay, M. A. Organometallic Chemistry Gordon Research Conference, July 12-17, 2009.
24. “Metalla-Azadipyromethenes: Synthesis and Optical Properties,” **Gray, T. G.**; Teets, T. S.; Partyka, D. V.; Deligonul, N. Organometallic Chemistry Gordon Research Conference, July 12-17, 2009.
25. “Copper-catalyzed Gold(I) Click Chemistry,” Gao, L.; Partyka, D. V.; **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 238: INOR-862 August 16-20, 2009.
26. “Synthesis of a new series of phosphine gold(I) triazole dendrimers with a fluorescent marker,” Robilotto, T. J.; Alt, D. S.; von Recum, H. A; **Gray, T. G.** *Abstr. Pap. Am. Chem. Soc.* 238: INOR-871 August 16-20, 2009.

**INVITED SEMINARS**

1. “Ground- and Excited-State Attributes of Hexanuclear Rhenium(III) Chalcogenide Clusters.” Condensed Matter Physics Seminar, Department of Physics, Case Western Reserve University, September 9, 2005. Professor Harsh Mathur, host.

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2. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry and Biochemistry, Northern Illinois University, October 17, 2005. Professor Narayan S. Hosmane, host.
3. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry, John Carroll University, October 19, 2005. Professor David P. Mascotti, host.
4. "Excited-State Attributes of Metal-Metal Bonded Clusters." Department of Chemistry, Cleveland State University, November 4, 2005. Professor Stan Duraj, host.
5. "R-Rated [Aurated] Organometallic Compounds." Department of Chemistry, University of Akron. Professor Christopher Ziegler, host. October 1, 2006.
6. "R-Rated [Aurated] Organometallic Compounds." Department of Chemistry, Penn State Erie, the Behrend College. Professor Michael Justik, host. December 11, 2006.
7. "Gilded Organometallics." Department of Chemistry, The Ohio State University. Professor Claudia Turró, host. February 22, 2008.
8. "Gilded Organometallics." Department of Chemistry, Texas Christian University. Professor Robert Neilson, host. February 28, 2008.
9. "Gilded Organometallics." Department of Chemistry, Southern Methodist University. Professor John A. Maguire, host. February 29, 2008.
10. "R-Rated and X-rated Organometallics." Department of Chemistry, Illinois State University. Professor Lisa Szczepura, host. March 7, 2008.
11. "Gilded Organometallics." Department of Chemistry, Tulane University. Professor James P. Dohanue, host. April 28, 2008.
12. "Gilded Organometallics." Department of Chemistry, Louisiana State University. Professor George Stanley, host. April 30, 2008.
13. "Gilded Organometallics." Department of Chemistry, Purdue University. Professor Tong Ren, host. October 7, 2008.
14. "Gilded Organometallics." Department of Chemistry, Carnegie Mellon University. Professor Catalina Achim, host. February 26, 2009.
15. "Organogold Chemistry While Recognizing That All That Glisters is Not Gold." Department of Chemistry, The University of Florida. Professor Adam Veige, host. April 6, 2009.

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16. “Gilded Organometallics.” Department of Chemistry, Emory University. Professor Karl Hagen, host. April 7, 2009.
17. “Gilded Organometallics.” Department of Chemistry and Biochemistry. Georgia Institute of Technology. Professor Jake Soper, host. April 8, 2009.
18. “Gilded Organometallics.” Department of Chemistry, The University of Texas at El Paso. Professor Keith Pannell, host. April 15, 2009.
19. “Gilded Organometallics.” Department of Chemistry and Biochemistry, New Mexico State University. Professor Jeremy Smith, host. April 16, 2009.
20. “Gilded Organometallics.” Department of Chemistry, University of Michigan. Professor Bart Bartlett, host. May 19, 2009.
21. “Gilded Organometallics.” Department of Chemistry, Case Western Reserve University. Professor Mary Barkley, host. August 27, 2009.
22. “Gilded Organometallics.” Department of Chemistry, Bowling Green State University. Professor Felix Castellano, host. October 28, 2009.
23. “Gilded Organometallics.” Department of Chemistry, The University of California, Berkeley. Professor Christopher J. Chang, host. November 20, 2009.