

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. Frank Hovorka Assistant Professor of Chemistry, 2007-present.

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)
Valedictorian, 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

Numbers 23 and 27–49 represent work done at Case Western Reserve University.

1. “Structural Distortions in Main-Group Metallacarboranes,” 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 Metallacarboranes: Crystal Structures of 1-(CMe₃)-1-Ga(2,2'-C₁₀H₈N₂)-2,3-(SiMe₃)₂-2,3-C₂B₄H₄, 1-(CMe₃)-1-Ga(L)-2,4-(SiMe₃)₂-2,4-C₂B₄H₄ [L = 2,2'-C₁₀H₈N₂, 2,2'-C₈H₆N₄], *closo*-1-(Me₂CH)-1-In-2,4-(SiMe₃)₂-2,4-C₂B₄H₄, and 1-(Me₂CH)-1-In(2,2'-C₁₀H₈N₂)-2,4-(SiMe₃)₂-C₂B₄H₄,” 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)₄Li][(SiMe₃)₄C₄B₈H₉] and [(THF)₂Mg(SiMe₃)₄C₄B₈H₈],” 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-(SiMe₃)₂-1,2-C₂B₄H₄ to *closo*-1,6-(SiMe₃)₂-1,6-C₂B₄H₄: 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-C₂B₄ 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, C₅H₉NOS," **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 [Re₆(μ₃-Se)₈]²⁺," 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 [Re₆S₈]²⁺ and [Re₆Se₈]²⁺," **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 C₄B₈ 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 [Re₆^{III}(μ₃-Se)₈]²⁺ 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 [Re₆Se₈(PEt₃)_n(CN)_{6-n}]ⁿ⁻⁴ (n = 4, 5) and Kinetics of Solvate Ligand Exchange on the Cubic [Re₆Se₈]²⁺ 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 CO₂-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 Metallacarboranes 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(μ_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 π -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.; **Gray, T. G.** *Inorg. Chem.* **2009**, *48*, 8134–8144.

45. "Mono- and Di-Gold(I) Naphthalenes and Pyrenes: Synthesis, Crystal Structures, and Photophysics," Geo, 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.* **in press**. DOI: 10.1021/ic901257s
48. "Copper-Catalyzed Huisgen [3 + 2] Cycloaddition of Gold(I) Alkynyls with Benzyl Azide. Syntheses, Structures, and Photophysics," Partyka, D. V.; Gao, L.; Updegraff, J. B. III; Deligonul, N.; **Gray, T. G.**, *Organometallics* **in press**. DOI: 10.1021/om9005774

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.
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.

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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.
17. “Luminactive Gold Complexes: Synthesis and Photophysics,” **Gray, T. G.**; Partyka, D. V.; Teets, T. S.; Updegraff, J. B. III; Gao, L.; Robilotto, 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.; Robilotto, 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.; Robilotto, 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.

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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.
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.

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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.
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.

RESEARCH PERSONNEL

- **Graduate Research Assistants**

Current

Ms. Miya Peay	January 2005–present
Mr. Thomas Robilotto	March 2005–present
Ms. Lei Gao	January 2006–present
Ms. Nihal Deligonul	January 2009–present
Mr. Ayan Maity	January 2009–present

Previous

Dr. James Updegraff	January 2005–April 2009
Ms. Kiera A. Knappman	July–August 2005 (GAANN summer rotation)
Mr. Alden Voelker	June 2008–August 2008 (summer rotation)

- **Undergraduate Research Assistants** (All are or were Case Western Reserve students.)

Mr. Jeremy Winkler ('06)	January–May 2006
Mr. Thomas Teets ('07)	January 2005–May 2007
Ms. Jenna Vergotz ('07)	January 2005– May 2007
Mr. Karolis Grigas ('09)	September 2004–October 2006; January–May 2007.
Mr. Daniel Alt ('09)	June 2008–May 2009
Mr. Daniel Niedzwiecki ('10)	January 2009–present

- **Postdoctoral Research Associate**

Dr. David V. Partyka (Ph.D. Harvard University, 2005) October 2005–March 2007
Present position: President and CEO, Creative Chemistry, LLC.

RESEARCH COLLABORATIONS

Professor Anthony Berdis, Case Western Reserve University School of Medicine. Studies of gold incorporation into abasic lesions of nucleic acids. Initiated jointly by Berdis, Lee, and Gray.

Professor Carlos. E. Crespo-Hernández, Case Western Reserve University. Ultrafast optical measurements on gold(I) organometallics. Initiated by Gray.

THOMAS G. GRAY

Professor Irene Lee, Department of Chemistry, Case Western Reserve University. Studies of gold incorporation into abasic lesions of nucleic acids. Initiated jointly by Berdis, Lee, and Gray.

Professor John D. Protasiewicz, Department of Chemistry, Case Western Reserve University. Density-functional theory calculations on low-coordinate phosphorus compounds. Initiated by Protasiewicz.

Professor Geneviève Sauvé, Case Western Reserve University. Density-functional theory calculations on materials relevant to solar cell fabrication. Initiated by Sauvé.

Professor Horst von Recum, Case Western Reserve University School of Engineering. Cytotoxicity studies of gold nanomaterials. Initiated by Gray.

Dr. David V. Partyka, Creative Chemistry, LLC. Nanomedicinal chemistry of gold. Initiated by Partyka.

Professor James P. Donahue, Tulane University. Density-functional theory calculations on Jahn-Teller active compounds of nickel, palladium, and platinum. Initiated by Donahue.

Professor Adam Veige, University of Florida. Density-functional theory calculations on early-transition metal amido complexes. Initiated by Veige.

(Past) Professor Evgeny V. Dikarev, State University of New York (Albany). Density-functional theory studies of bismuth-transition element heterobimetallics. Initiated by Dikarev.

(Past) Professor Joseph P. Sadighi, Massachusetts Institute of Technology. Theoretical studies of group 11 Arduengo-carbene complexes. Initiated by Sadighi.