

DEANNA L. ZUBRIS

Associate Professor
Department of Chemistry
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PROFESSIONAL EXPERIENCE

- Villanova University, Villanova, PA* August 2009–Present
Associate Professor of Chemistry
- Villanova University, Villanova, PA* August 2002–August 2009
Assistant Professor of Chemistry
- Harvard University, Cambridge, MA* September 2000–July 2002
National Institutes of Health Postdoctoral Fellow (with Professor Andrew G. Myers)
Developed methodology for the synthesis of a library of piperazines with varying substitution patterns, utilizing condensation of C- and N-protected α -amino aldehydes.
- California Institute of Technology, Pasadena, CA* September 1995–July 2000
Graduate Research Assistant (with Professor John E. Bercaw)
Dissertation: *Investigations of the Origin of Stereocontrol in Syndiospecific Ziegler-Natta Polymerizations*
- University of Rochester, Rochester, NY* September 1994–May 1995
Undergraduate Research Assistant (with Professor William D. Jones)
Pursued the synthesis of cobalt and rhodium organometallic complexes for C-C bond activation studies.

EDUCATION

- Ph.D., Chemistry** July 2000
California Institute of Technology, Pasadena, CA
- B.S., Chemistry, magna cum laude** May 1995
University of Rochester, Rochester, NY

HONORS AND PROFESSIONAL AFFILIATIONS

- ACS Younger Chemists Committee Leadership Development Award*, October 31, 2004.
- National Institutes of Health Postdoctoral Fellowship*, 2000–2002.
- Dow Chemical Company Travel Fellowship*, Department of Chemistry, California Institute of Technology, 1998.
- Phi Beta Kappa National Honor Society* (Iota of New York), 1995.
- American Chemical Society*, 1994–present, member (inorganic, organic, and polymer divisions).
- Council on Undergraduate Research*, 2004–present, member.
- Sigma Xi*, 2004–present, member.

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PUBLICATIONS

(* denotes research conducted at Villanova University with D. L. Zubris as P.I.)

Steves, J. E.; Kennedy, M. D.; Chiang, K. P.; Kassel, W. S.; Dougherty, W. G.; Dudley, T. J.; Zubris, D. L.* Synthesis of a bulky bis(imino)pyridine ligand: A methodology for systematic variation of steric bulk and energetic implications for metallation. *Dalton Trans.*, **2009**, 1214–1222.

Axtell, J. A.; Thai, S. D.; Morton, L. A.; Kassel, W. S.; Dougherty, W. G.; Zubris, D. L.* Syntheses of *rac/meso*-{PhP(3-*t*-Bu-C₅H₃)₂}-Zr{RN(CH₂)₃NR}, structural analyses of *rac*-{PhP(3-*t*-Bu-C₅H₃)₂}-Zr{RN(CH₂)₃NR} (where R is SiMe₃ or Ph), and *meso* to *rac* isomerization. *J. Organomet. Chem.*, **2008**, 25, 3741–3750.

Zubris, D. L.* Doubly Bridged Metallocenes for Stereoselective Propylene Polymerization. In *Stereoselective Polymerization with Single-Site Catalysts*, Baugh, L. S., Canich J. M., Eds.; Taylor & Francis: Boca Raton, FL, 2008, pp. 101–134. Invited book chapter.

Chirik, P. J.; Zubris, D. L.; Ackerman, L. J.; Henling, L. M.; Bercaw, J. E. Preparation of *ansa*-Niobocene and *ansa*-Tantalocene Olefin Hydride Complexes as Transition State Analogs in Metallocene-Catalyzed Olefin Polymerization. *Organometallics* **2003**, 22, 172–187.

Perthuisot, C.; Edelbach, B. L.; Zubris, D. L.; Simhai, N.; Iverson, C. N.; Muller, C.; Satoh, T.; Jones, W. D. Cleavage of the Carbon-Carbon Bond in Biphenylene using Transition Metals. *J. Mol. Catal. A: Chem.* **2002**, 189, 157–168.

Zubris, D. L.; Veghini, D.; Herzog, T. A.; Bercaw, J. E. Reactivity and Mechanistic Studies of Stereocontrol for Ziegler-Natta Polymerization Utilizing Doubly-Silylene Bridged Group 3 and Group 4 Metallocenes. In *Olefin Polymerization: Emerging Frontiers*; Arjunan. P., McGrath, J. E., Hanlon, T. L., Eds.; ACS Symposium Series 749; American Chemical Society: Washington, DC, 2000, pp 2–14.

Millar, S. P.; Zubris, D. L.; Bercaw, J. E.; Eisenberg, R. On the Mechanism of Dihydrogen Addition to Tantalocene Complexes. *J. Am. Chem. Soc.* **1998**, 120, 5329–5330.

Perthuisot, C.; Edelbach, B. L.; Zubris, D. L.; Jones, W. D. C-C Activation in Biphenylene. Synthesis, Structure, and Reactivity of (C₅Me₅)₂M₂(2,2'-biphenyl) (M = Rh, Co). *Organometallics* **1997**, 16, 2016–2023.

Herzog, T. A.; Zubris, D. L.; Bercaw, J. E. A New Class of Zirconocene Catalysts for the Syndiospecific Polymerization of Propylene and its Modification for Varying Polypropylene from Isotactic to Syndiotactic. *J. Am. Chem. Soc.* **1996**, 118, 11988–11989.

PRESENTATIONS

(* denotes research conducted at Villanova University with D. L. Zubris as P.I.)

External Presentations (presenter is underlined)

Axtell, J. C.; Thai, S. D.; Morton, L. A.; Kassel, W. S.; Dougherty, W. G., Jr.; Zubris, D. L.* “Synthesis and *meso* to *rac* isomerization of *rac/meso-ansa*-zirconocenes with a phosphine linker.” Oral presentation at the 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 22-26, 2009. Abstract: INOR-596.

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Steves, J. E.; Kennedy, M. D.; Chiang, K. P.; Kassel, W. S.; Dougherty, W. G., Jr.; Dudley, T. J.; Zubris, D. L.* “Synthesis of a sterically hindered bis(imino)pyridine compound as a potential ligand for iron(II).” Oral presentation at the 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 22-26, 2009. Abstract: INOR-595.

Kennedy, M. D.; Steves, J. E.; Chiang, K. P.; Kassel, W. S.; Dougherty, W. G., Jr.; Dudley, T. J.; Zubris, D. L.* “New methodology for synthesis of C_s - and C_1 -symmetric bis(imino)pyridines and energetic implications for metalation.” Poster presentation at the 237th National Meeting of the American Chemical Society, Salt Lake City, UT, March 22-26, 2009. Abstract: INOR-529.

Morton, L. A.; Zubris, D. L.* “Synthesis and characterization of $\text{PhP}(\eta^5\text{-}t\text{-BuCp})_2\text{ZrCl}_2$: A novel *ansa*-zirconocene with a phosphine linker.” Poster presentation at the 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25-29, 2007. Abstract: INOR-962.

Morton, L. A.; Zubris, D. L.* “Synthesis and characterization of $\text{PhP}(\eta^5\text{-}t\text{-BuCp})_2\text{ZrCl}_2$: A novel *ansa*-zirconocene with a phosphine linker.” Poster presentation at the 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25-29, 2007. Abstract: INOR-962.

Morton, L. A.; Zubris, D. L.* “Synthesis and characterization of $\text{PhP}(\eta^5\text{-}t\text{-BuCp})_2\text{ZrCl}_2$: A novel *ansa*-zirconocene with a phosphine linker.” Poster presentation at the 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25-29, 2007. Abstract: INOR-962.

Zubris, D. L.*, invited lecture, “Synthesis of sterically hindered bis(imino)pyridine ligands.” The State University of New Jersey, Rutgers – Camden, Camden, NJ, March 3, 2008.

Zubris, D. L.*; Morton, L. A.; Thai, S. D. “Synthesis and characterization of novel *ansa*-zirconocenes with a phosphine linker.” Oral presentation at the 39th Middle Atlantic Regional Meeting of the American Chemical Society, Collegeville, PA, May 16-18, 2007. Abstract: MARM-010.

Morton, L. A.; Zubris, D. L.* “Synthesis and characterization of $\text{PhP}(\eta^5\text{-}t\text{-BuCp})_2\text{ZrCl}_2$: A novel *ansa*-zirconocene with a phosphine linker.” Poster presentation at the 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25-29, 2007. Abstract: INOR-962.

Thai, S. D.; Daundikhed, N. S.; Zubris, D. L.* “Progress toward the synthesis of $[(\text{Me}_2\text{Si})(\text{PhC}=\text{CPh})\{\eta^5\text{-C}_5\text{H}_2\text{-4-}t\text{-Bu}\}_2]\text{ZrCl}_2$.” Poster presentation at the 233rd National Meeting of the American Chemical Society, Chicago, IL, March 25-29, 2007. Abstract: INOR-952.

Chiang, K. P.; Zubris, D. L.* “Synthesis of Pyridine-bis(imine) Ligands.” 70th Annual Intercollegiate Student Chemists Convention, Ursinus College, Collegeville, PA, April 22, 2006.

Chong, A. A.; Zubris, D. L.* “Progress Toward the Synthesis of Silicon/Phosphorous Doubly-Bridged Group 4 Metallocenes.” Poster presentation at the annual student poster session of the Catalysis Club of Philadelphia, Claymont, DE, January 20, 2005.

Daundikhed, N.; Zubris, D. L.* “Progress Towards the Synthesis of an Etheno-Silyl Doubly-Bridged *ansa*-Zirconocene Catalyst for the Polymerization of α -Olefins.” Poster presentation at the annual student poster session of the Catalysis Club of Philadelphia, Claymont, DE, January 20, 2005.

Chong, A. A.; Zubris, D. L.* “Progress Toward the Synthesis of Silicon/Phosphorous Doubly-Bridged Group 4 Metallocenes.” Poster presentation at the 32nd Northeast Regional Meeting of

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the American Chemical Society, Rochester, NY, October 31-November 3, 2004. Abstract: GEN-081.

Zubris, D. L.; Chirik, P. J.; Henling, L. M.; Bercaw, J. E. "Olefin adducts of group 5 metallocenes as models for Ziegler-Natta polymerization." Oral presentation at the 218th National Meeting of the American Chemical Society, New Orleans, LA, August 22-26, 1999. Abstract: INOR-522.

Zubris, D. L.; Henling, L. M.; Day, M. W.; Bercaw, J. E. "Synthesis and reactivity of doubly (silylene-bridged) group 3 metallocenes." Poster presentation at the 217th National Meeting of the American Chemical Society, Anaheim, CA, March 21-25, 1999. Abstract: INOR-152.

Millar, S. P.; Zubris, D. L.; Bercaw, J. E.; Eisenberg, R. "Parahydrogen induced polarization in hydrogen addition to tantalocene complexes." Oral presentation at the 215th National Meeting of the American Chemical Society, Dallas, TX, March 29-April 2, 1998. Abstract: INOR-024.

Internal Presentations (presenter is underlined)

Axtell, J.C.; Thai, S. D.; Zubris, D. L.* "Synthesis and Characterization of Singly Bridged Zirconocenes with Phosphine Linkers." Villanova Undergraduate Summer Research Poster Session, September 25, 2007.

Steves, J. E.; Zubris, D. L.* "Synthesis and Characterization of a Pyridine bis(imine) Ligand Precursor." Villanova Undergraduate Summer Research Poster Session, September 25, 2007.

Thai, S. D.; Daundikhed, N. S.; Zubris, D. L.* "Progress toward the synthesis of $[(\text{Me}_2\text{Si})(\text{PhC}=\text{CPh})\{\eta^5\text{-C}_5\text{H}_2\text{-4-}t\text{-Bu}\}_2]\text{ZrCl}_2$." Sigma Xi Research Day, Villanova, PA, April 27, 2007. Poster awarded 1st prize for chemistry.

Chiang, K. P.; Zubris, D. L.* "Synthesis of Pyridine-bis(imine) Iron Compounds." Villanova Undergraduate Summer Research Poster Session, October 4, 2005.

Chiang, K. P.; Zubris, D. L.* "Synthesis of Pyridine-bis(imine) Iron Compounds." Villanova Undergraduate Summer Research Poster Session, September 28, 2004.

Chiang, K. P.; Zubris, D. L.* "Synthesis of Pyridine-bis(imine) Iron Compounds." Villanova Undergraduate Summer Research Poster Session, October 9, 2003.

GRANTS AND EQUIPMENT DONATIONS

Equipment donation – Additives Division of Arkema, King of Prussia, PA, July 2007.
Obtained laboratory glassware (net worth approximately \$5,000).

Petroleum Research Fund (PRF) Type G Research Grant, Award period: 9/01/06–8/31/08.
"Doubly Bridged Metallocenes with Two Distinct Interannular Linkers: Synthesis and Regioselectivity for alpha-Olefin Polymerization." Decision: funded at \$35,000.

Equipment donation – Additives Division of Atofina Chemicals, King of Prussia, PA, May 2004.
Obtained laboratory glassware (net worth approximately \$5,000).

Petroleum Research Fund (PRF) Type G Research Grant, proposal submitted August 2003.
"Coordination Polymerization of 1,1-Disubstituted Olefins." Decision: not funded.

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Equipment donation – GlaxoSmithKline, King of Prussia, PA, August 2003.

Obtained laboratory equipment (net worth approximately \$25,000).

Villanova University Summer Research Fellowship (SRF) and Research Support Grant (RSG),

Award period: Summer 2003. “Coordination Polymerization of 1,1-Disubstituted Olefins.”

Decision: funded at \$9,700.

Equipment donation – Ortho Clinical Diagnostics, Philadelphia, PA, December 2002.

Obtained gas chromatograph and ancillary components (net worth approximately \$20,000).

Camille & Henry Dreyfus Foundation Faculty Start-up Grant for Undergraduate Institutions,
proposal submitted Summer 2002. Decision: not funded.

National Institutes of Health – National Research Service Award Postdoctoral Fellowship,

Award period: 2000-2002. “New Methods for Carbon Bond Formation.” Decision: funded.

Research carried out at Harvard University, grant number: 1 F32 GM20838-01.

STUDENT RESEARCH COLLABORATORS – UNDERGRADUATE

Jonathan Axtell: researcher, Summer 2007–Spring 2008, Fall 2008–present. B. S. Chemistry, anticipated May 2010.

Janelle Steves: researcher, Summer 2007–Spring 2008, Fall 2008–present. B. S. Chemistry, anticipated May 2010.

Susan Thai: researcher, Fall 2005. B. S. Chemistry, December 2005. Current status: M.S. candidate in chemistry at Villanova University.

Margaret Greene: researcher, Fall 2004, Spring 2005. B.S. Chemistry, May 2005. Current status: Ph.D. candidate in chemistry at the University of California, Irvine.

Karen Chiang: researcher, Summer 2003, 2004, and Summer 2005–Spring 2006. B.S. Chemistry, May 2006. Current status: Ph.D. candidate in chemistry at the University of Rochester.

Jennie Dilemma: researcher, Spring 2003. B.S. Comprehensive Science, May 2003. Current employer: GlaxoSmithKline

STUDENT RESEARCH COLLABORATORS – M.S. AND POSTDOCTORAL

Nathalie Jaeger: Summer 2009–present.

Rachel Hardie: Spring 2009–present.

Margaret Kennedy: Fall 2007–Summer 2009. M.S. thesis title, “Synthesis of and computational studies on C_s - and C_1 - symmetric bis(imino) pyridine ligands.” Defense date: July 30, 2009. Current employer: U.S. Coast Guard Academy.

Susan Thai: Spring 2006–Fall 2008. M.S. thesis title, “Progress towards the synthesis of novel *ansa*-zirconocenes containing alkene or phosphine linkers.” Defense date: December 5, 2008. Current employer: U.S. Patent Office.

Laurel Morton (teaching/research postdoctoral fellow): Fall 2005–Spring 2007. Current status: tenure-track faculty member in chemistry at Eastern Kentucky University.

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Ronald Weber: Spring 2004–Spring 2006. M.S. thesis title, “Synthesis of pyridine-bis(imine) iron compounds for future polymerization studies.” Defense date: May 4, 2006. Current employer: GlaxoSmithKline.

Alice Chong: Spring 2004–Summer 2005. Current status: unknown.

Navneeth Daundikhed: Spring 2003–Summer 2005. M.S. thesis title, “Progress towards the synthesis of a doubly chelating metallocene analog and a doubly bridged *ansa*-metallocene for the polymerization of α -olefins.” Defense date: August 2, 2005. Current employer: Arkema.

TEACHING EXPERIENCE

Undergraduate courses taught to date

Inorganic Chemistry I & II
Inorganic Chemistry Laboratory I & II
General Chemistry II for Engineers
General Chemistry Laboratory II
Criminalistics Laboratory
Organic Chemistry II (co-taught)
Organic Chemistry Laboratory II
Professional Development Seminar

Graduate courses taught to date

Advanced Inorganic Chemistry I
Introductory Polymer Chemistry
Organometallics

SELECTED PROFESSIONAL SERVICE ACTIVITIES

Peer reviewer for the *National Science Foundation (NSF)*, *Petroleum Research Fund (PRF)*, *Research Corporation (RC)*, and *Kentucky Science and Engineering Foundation (KSEF)*.

Panelist, *NSF Chemistry Division Research Experiences for Undergraduates (REU) Review*, November 2005.

Peer reviewer for the journal *Organometallics*.

Pre-publication reviewer for *Organometallic Chemistry*, by Gary O. Spessard and Gary L. Miessler, 2nd Edition, May 2004 (general comments), May 2006 (general comments), October 2007 (4 chapters reviewed), July 2008 (3 chapters reviewed), and April 2009 (end-of-chapter problem answer keys for 2 chapters reviewed).

Wrote and reviewed test questions for the *Educational Testing Service*, chemistry division, Summer 2004 and Summer 2005; general science division, June 2005 and April 2006.

Wrote and reviewed test questions for the chemistry test of the *Graduate Record Examinations (GRE Chemistry test)*, February 2005.

Presided over *Organic Chemistry General Session II*, 39th Middle Atlantic Regional Meeting of the American Chemical Society, Ursinus College, Collegetown, PA, May 16-18, 2007.

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Chemistry judge for the following events: *67th Intercollegiate Student Chemists' Conference*, Villanova University, April 5, 2003 (also served as judge coordinator); *Sigma Xi Research Day*, Villanova University, April 4, 2003, April 23, 2004, and April 25, 2009; *Bryn Mawr College Mathematics and Science Graduate Research Symposium*, Bryn Mawr College, October 3, 2003.

Participated in hands-on chemistry outreach activities: *12th Annual Student Research Symposium, "Research the Possibilities"*, in conjunction with the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology, Villanova University, June 5, 2005; *Expand Your Horizons*, an ACS WCC sponsored program for 6th grade girls, at Chestnut Hill College, November 3, 2007 and April 4, 2009.

SELECTED UNIVERSITY SERVICE ACTIVITIES

President, *Phi Beta Kappa, Sigma Chapter of PA*, Villanova University, Fall 2005–present.

Member, *Committee on Members in Course, Phi Beta Kappa*, Spring 2004–present.

Member, *VITAL (Villanova Institute for Teaching and Learning) Sciences Advisory Committee*, Fall 2007–present (3-year term).

Member, *Status of Women Faculty Committee*, College of Liberal Arts and Sciences, Fall 2005–Summer 2007.

Member, *Graduate Committee*, Chemistry Department, Fall 2002–present.

Co-chair, *Inorganic Chemistry Faculty Member Search Committee*, Chemistry Department, Fall 2007.

Member, *Theoretical Chemistry Faculty Member Search Committee*, Chemistry Department, Fall 2004.

Member, *Peer Teaching Committee*, Chemistry Department, Fall 2003–Spring 2004, Spring 2009.

Submitted brief sections for the following departmental grant applications: NSF grant for LC-MS instrumentation (Spring 2005, Spring 2006 – grant awarded), NSF grant for X-ray diffractometer (Spring 2005 – grant awarded), NSF grant for optical instrumentation (Summer 2009).

Participant in outreach programs for incoming freshman students, *Choices that Matter* and *House Call – Connecting the Campus One Student at a Time*, Fall 2003–present.