

Curriculum Vitae

JOSHUA R. FARRELL

Thomas D'Ambra Assistant Professor of Chemistry

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Research Experience and Education

Thomas E. D'Ambra Assistant Professor of Chemistry, College of the Holy Cross (2002 - Present)

- Research topics include inorganic supramolecular chemistry and bioinorganic chemistry.

National Institutes of Health Postdoctoral Fellow, Massachusetts Institute of Technology (1999-2002)

- Postdoctoral Researcher in the laboratory of Prof. Stephen J. Lippard
- Research topics included the design, synthesis, and characterization of small molecule models for non-heme diiron enzymes.

Doctorate of Philosophy, Inorganic Chemistry, Northwestern University (1999)

- Research Advisor: Prof. Chad A. Mirkin
- Dissertation Topics: Discovery and systematic examination of a new, general method for the high yield synthesis of flexible metal-containing two- and three-dimensional supramolecular complexes.
- Departmental Award for Excellence in Graduate Research

Master of Science, Inorganic Chemistry, Northwestern University (1995)

Bachelor of Arts, College of the Holy Cross (1994)

- Graduated with Honors in Chemistry
- Council on Undergraduate Research Summer Research Fellowship (1993)
- National Merit Scholar (1990-1994)

Publications

Doctoral Dissertation

J. R. Farrell, "The Weak-Link Approach to the Synthesis of Inorganic Macrocycles" **1999**.

Peer Reviewed Research Articles

1. C. S. Higham, D. P. Dowling, J. L. Shaw, A. Cetin, C. J. Ziegler, J. R. Farrell "Multidentate aminophenol ligands prepared with Mannich condensations." *Tet. Lett.* **2006**, *47*, 4419-4423.
2. J. R. Farrell, C. Becker, D. P. Lavoie, J. L. Shaw, C. J. Ziegler "New emissive *fac*-tricarbonylchlorobis(ligand)rhenium(I) complexes prepared from pyridine/thiophene hybrid ligands." *J. Organometallic Chem.* **2004**, *689*, 1122-1126.
3. J. Kuzelka, J. R. Farrell, S. J. Lippard "Modeling the Syn Disposition of Nitrogen Donors at the Active Sites of Carboxylate-Bridged Diiron Enzymes. Enforcing Dinuclearity and Kinetic Stability with a 1,2-Diethynylbenzene-Based Ligand." *Inorg. Chem.* **2003**, *42*, 8652-8662.
4. F. M. Dixon; M. S. Masar; P. E. Doan; J. R. Farrell, F. P. Arnold; C. A. Mirkin; C. D. Incarvito; L. N. Zakhaov; A. L. Rheingold "Rh(II) and Rh(I) Two-Legged Piano Stool Complexes: Structure, Reactivity, and Electronic Properties" *Inorg. Chem.* **2003**, *42*, 3245-3255.
5. J. R. Farrell, D. Stiles, W. Bu, S. L. Lippard "Preparation of Macrocyclic and "C-Clamp" Dicarboxylate Compounds" *Tetrahedron*, **2003**, *59*, 2463-2469.
6. F. M. Dixon, J. R. Farrell, P. E. Doan, A. S. Williamson, D. A. Weinberger, C. A. Mirkin, C. L. Stern, C. D. Incarvito, L. M. Liable Sands, L. N. Zakharov, A. L. Rheingold. "Rational Design of a Novel Mononuclear Rh(II) Complex." *Organometallics*, **2002**, *21*, 3091-3093.
7. F. M. Dixon, A. H. Eisenberg, J. R. Farrell, C. A. Mirkin, L. M. Liable-Sands, A. L. Rheingold. "Neutral Macrocycles Via Halide-Induced Ring Opening of Binuclear Condensed Intermediates." *Inorg. Chem.* **2000**, *39*, 3432-3433.
8. J. R. Farrell, A. H. Eisenberg, C. A. Mirkin, I. A. Guzei, L. M. Liable-Sands, C. D. Incarvito, A. L. Rheingold, C. L. Stern. "Templated Formation of Binuclear Macrocycles via Hemilabile Ligands." *Organometallics*, **1999**, *18*, 4856-4868.
9. B. J. Holliday, J. R. Farrell, C. A. Mirkin. "Metal-Directed Assembly of Triple Layered Fluorescent Metallocyclophanes." *J. Am. Chem. Soc.*, **1999**, *121*, 6316-6317.
10. J. R. Farrell, C. A. Mirkin, L. M. Liable-Sands, A. L. Rheingold. "Strategy for Preparing Molecular Cylinders with Synthetically Programmable Structural Parameters." *J. Am. Chem. Soc.*, **1998**, *120*, 11834-11835.
11. J. R. Farrell, C. A. Mirkin, I. A. Guzei, L. M. Liable-Sands, A. L. Rheingold. "The Weak-Link Approach to the Synthesis of Inorganic Macrocycles." *Angew. Chem. Intl. Ed.*, **1998**, *37*, 465-467.

Presentations

- 1) "Synthesis of transition metal containing conducting polymers." Mount Holyoke College, April 2007.
- 2) J. R. Farrell, D. P. Lavoie, R. T. Pennell, C. J. Ziegler, J. L. Shaw. "Polyelectrochromic Re(I) and Pt(II) polymers from pyridine/thiophene hybrid ligands." *233rd ACS National Meeting*, Chicago, IL, March 2007. Abst. INOR-247.
- 2) *Gordon Research Conference on Inorganic Chemistry*, "Multidentate aminophenol ligands prepared with Mannich condensations." Newport, RI, July 2006.
- 3) *Gordon Research Conference on Inorganic Chemistry*, "Pyridine-thiophene Hybrid Ligands as Supramolecular Starting Materials." Newport, RI, July 2004.
- 4) J. R. Farrell. "A Nanotechnology Course for Undergraduates." *31st Northeast Regional Meeting of the American Chemical Society*, Saratoga Springs, NY, June, 2003. Abst. 193
- 5) *Gordon Research Conference on Inorganic Chemistry*, "New Macrocyclic Dicarboxylate Ligands." Newport, RI, July 2001.
- 6) J. R. Farrell, D. T. Stiles, S. J. Lippard. "New multidentate cyclic carboxylate ligands." *222nd ACS National Meeting*, Chicago, IL, August 2001. Abst. INOR 185.
- 7) J. R. Farrell, B. J. Holliday, C. A. Mirkin, I. A. Guzei, L. M. Liable-Sands, A. L. Rheingold. "The "Weak-Link" Approach to Synthesizing Inorganic Macrocycles and Complex Molecular Structures." *216th ACS National Meeting*, Boston, MA, August 1998. Abst. INOR 631.
- 8) *Gordon Research Conference on Organometallic Chemistry*, "The Weak Link Approach to the Synthesis of Organometallic Macrocycles and Complex Three Dimensional Structures." Newport, RI, July 1998.
- 9) C. A. Mirkin, J. R. Farrell. "The "Weak-Link" Approach to Synthesizing Large Organometallic Ring Structures and Cages." *214th ACS National Meeting*, Las Vegas, NV, Sept. 1997, Abst INOR 146.
- 10) C. A. Sassano, J. R. Farrell, C. A. Mirkin. "Synthesis and Characterization of Phosphino-Arene and Phosphino-Ether Redox-Switchable Hemilabile Ligands and Their Transition Metal Complexes." *210th ACS National Meeting*, Chicago, IL, August 1995, Abst. INOR 206t.

**Teaching
Experience and
Awards**

- Classes taught include Atoms and Molecules (Chem 101), Organic Chemistry 1 (Chem 221), Organic Chemistry 2 (Chem 222), Introduction to Equilibrium and Reactivity (Chem 231), Advanced Inorganic Chemistry (Chem 301), Nanotechnology (Chem 312), Physical and Inorganic Chemistry Lab (Chem 338), and General and Chem Honors Research (Chem 405/407)
- Alumni Continuing Education Day Speaker, “Nanotechnology: Separating Fact From Fiction on the Scientific Frontier” (2007)
- Center for Talented Youth Seminar Speaker, “Nanotechnology: Fact or Fiction.” (2003, 2007)
- Donald E. Smith Award for Excellence in C-Level Teaching (Northwestern University)
- Preparing Future Faculty (PFF) Fellow (1996-1998)
- Teaching Assistant for Upper-level Undergraduate Electrochemistry Laboratory (1997-1998)
- Teaching Assistant for Chemistry for Engineers (1994-1996)

**Undergraduate
Mentoring**

- Brittany Bergeron, College of the Holy Cross, 2007-present
- Theron Fussell, College of the Holy Cross, 2007-present
- Gil Gomez, College of the Holy Cross, 2007-present
- Kevin McCarthy, College of the Holy Cross, 2007-present
- Eric Yoon, College of the Holy Cross, 2007-present
- Jonathon Niconchuk, College of the Holy Cross, 2006-present
- Mark Andrews, College of the Holy Cross, 2005-2007
- Ryan Pennell, College of the Holy Cross, 2006-2007
- Christine Higham, College of the Holy Cross, 2003-2006
- David Lavoie, College of the Holy Cross, 2003-2006
- Darren Andrade, College of the Holy Cross, 2003-2004
- Daniel Dowling, College of the Holy Cross, 2003-2004
- Keith Reardon, College of the Holy Cross, 2003-2004
- Clinton Becker, College of the Holy Cross, 2003
- Michael Beltran, College of the Holy Cross, 2002 – 2003
- Lynn Glauber, College of the Holy Cross, 2002 – 2003
- Dylan Stiles, Massachusetts Institute of Technology, 2001-2002
- Amanda Williamson, Northwestern University, 1997-1998

Funding and Grants (Internal)

- Research and Publication Committee Grant, \$1,500, (2006)
- Research and Publication Committee Summer Faculty Fellowship/Charles and Rosanna Batchelor (Ford) Foundation Grant, \$3,500, (2005)
- Research and Publication Committee Summer Faculty Fellowship/Charles and Rosanna Batchelor (Ford) Foundation Grant, \$3,500, (2004)
- Research and Publication Committee Grant, \$1,500, (2004)
- Research and Publication Committee Grant, \$1,500, (2002)

Funding and Grants (External)

- Research Corporation Cottrell College Science Award. “Modular design of biomimetic ligands synthesized by Mannich condensations”, \$58,028 (2006-2008)
- The American Chemical Society Petroleum Research Fund Type G Grant. “A Ligand-Based Approach to the Control of Supramolecular Topology and Preparation of Electrochromic Materials”, \$35,000 (2005-2007)

Committee Service

- Finance and Planning Committee, 2005-present
- Japanese Teahouse Steering Committee, 2005-present
- Committee on Common Requirements, 2003-2004
- Cross and Crucible Society, 2002-2006
- Faculty Mentor – Club Baseball, 2004-present

Membership in Professional Societies

- American Chemical Society
- Council on Undergraduate Research