

## Curriculum Vitae

### LAWRENCE BARTON

Professor Emeritus of Chemistry at the University of Missouri St. Louis.

**MAILING ADDRESS:** Department of Chemistry  
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St. Louis, Missouri 63121

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#### EDUCATION:

B.Sc. Chemistry and Physics - 1960 Liverpool University

B.Sc. (hons) Chemistry - 1961 Liverpool University

Ph.D. Inorganic Chemistry - 1964 Liverpool University (with Dr. D. Nicholls)

Postdoctoral Research Associate - 1964-1966 Cornell University (with Prof. Richard F. Porter)

#### CURRENT ACTIVITIES

My current activities at UM-St. Louis include undergraduate advising, alumni relations, writing our alumni magazine- the UMSL CHEMIST, updating the web page and the graduate brochure and organizing events for the chemistry department. I also serve as a member of the Governing Board of the UM-St. Louis Alumni Association.

#### PROFESSIONAL EXPERIENCE:

UM-St. Louis Liaison for the Advanced Credit Program in Chemistry

Professor of Chemistry Emeritus, University of Missouri-St. Louis, 2007 - present

Director Emeritus, Center for NanoScience, 2006 – present.

Acting Director, Center for Molecular Electronics, Nov 1998 – 2006.

Professor of Chemistry, University of Missouri-St. Louis, 1986-2007

Chairman, Department of Chemistry, University of Missouri-St.Louis, 5/12/80 – 8/15/98

Visiting Associate Professor of Chemistry, The Ohio State University, 1977-78 and summer, 1979

Visiting Professor, Washington University, spring 1977

Associate Professor of Chemistry, University of Missouri-St. Louis, 1971-1986

Senior Research Fellow, Explosives Research and Development Establishment, Waltham Abbey, UK 1970-71

Assistant Professor of Chemistry, University of Missouri-St. Louis, 1966-71

## **HONORS AND AWARDS**

Named to the 2012 Class of ACS Fellows.

Boron in the Americas Award for Distinguished Achievements in Boron Science, 2004

Distinguished Service Award, UM-St. Louis, 2002.

UM-St. Louis Chancellor's Award for Faculty Service, 2000.

Distinguished Service Award, St. Louis Section, American Chemical Society, 1999.

Special Recognition Award, UM-St. Louis Alumni Association, 1998.

Potts Medallist, Liverpool University Chemical Society, 1992

St. Louis Award, American Chemical Society, 1991

UM-St. Louis Alumni Association, Faculty Service Award, 1990

Cited by the American Chemical Society for Chairing the St. Louis Section during the year it won the Award for Outstanding Performance in 1981.

Awarded Senior Research Fellowship, Explosives Research and Development Establishment, Waltham Abbey, Essex, England 1970-71

Goodlass Wall Fellowship, 1961-64 Liverpool University

## **ORGANIZATIONS**

The Royal Society of Chemistry, Honorary Member  
(Member of Dalton and Education sections)

American Chemical Society, Emeritus Member  
(Member of Inorganic and History of Chemistry Divisions)

## **MAJOR PROFESSIONAL APPOINTMENTS, ETC**

1979-80      Chairman-elect, St. Louis Section, American Chemical Society

1980-81      Chairman, St. Louis Section, American Chemical Society

1980-81      Vice-President, UMSL Chapter, American Association of  
University Professors

1983-85, 1994-95      President, St. Louis Research Council

2000-02      Chair, Faculty Senate and University Assembly, UMSL

1998-present Member, Governing Board, UM-St. Louis Alumni Association`

## RESEARCH INTERESTS

Synthesis, structure, and chemistry of borane and metallaborane cage compounds, boron oxygen ring systems, organometallic chemistry.

## RESEARCH SUPERVISION

### Postdoctoral

Dileep K. Srivastava, Ph.D. Banaras Hindu University, India  
Jonathon Bould, Ph.D. University of Leeds, England  
Hong Fang, University of Missouri St. Louis  
Rhodri Ll. Thomas, Ph.D. Heriot Watt University, Scotland  
Ramón Macías as, Ph.D. University of Leeds, England  
Mitsuhiro Hata, Ph.D. University of Tokyo, Japan  
Oleg Volkov, Ph.D. Institute of Inorganic Chemistry, Novosibirsk, Russia

### Graduate

Ph.D. F. L. Longcor, P. Rush, H. Fang, P. McQuade.

MS M. H. Owens, T. Zhu, S. Rahman, G. Biddlecombe.

### Undergraduate

D. Nuelle	F. Longcor	D. Brinza	P. Nevels	K. Hupp
C. Heil	J. Crump	D. Davis	M. Sharma	A. Steeples
D. Wester	J. Wheatley	M. Williams	R. Brewer	B. Tekle
M. Young	M. Owens	D. Rush	E. Razavia	K. Aldermann
G. Bohn	T. Russell	D. Bergstrom	H. Grunkemeyer	M. Petetit
S. Stanfield	C. Rieser	T. Tolley	T. Schweitzer	
D. Henton	R. Frease	D. Boyer	M. Pasieka	

## PH.D. THESIS COMMITTEES

Edward G. Vassian, University of Missouri-Columbia (1967)  
David L. Beach, University of Missouri-St. Louis (1976)  
Pauline L. Bellevance, University of Missouri-St. Louis (1977)  
Ali A. Bazzi, University of Missouri-St. Louis (1981)  
William A. VanArsdale, University of Missouri-St. Louis (1983)  
Shankar Ranavare, University of Missouri-St. Louis (1983)  
Rajiv Banavali, University of Missouri-St. Louis (1984)  
Susan Jansen, University of Missouri-St. Louis (1985)  
Greg Lumetta, University of Missouri-St. Louis (1986)  
Christy S. John, University of Missouri-St. Louis (1987)  
Ko-Chung Lin, University of Missouri-St. Louis (1987)  
Dawn L. Shiang, University of Missouri-St. Louis (1988)  
Ding Rong, University of Missouri-St. Louis (1991)  
Kathleen Fallis, University of Missouri-St. Louis (1992)  
Gang Bao, University of Missouri-St. Louis (1992)  
Abdul R. Khan, University of Missouri-St. Louis (1994)  
Chongfu Xu, University of Missouri-St. Louis (1994)  
Sohrab Abdohalli, University of Missouri-St. Louis (1995)  
Rafaat Shaltout, University of Missouri-St. Louis (1996)

Shengping Tian, University of Missouri-St. Louis (1996)  
Anne M. Cafferty, University of Missouri-St. Louis (1997)  
Ali A. Kasiri, University of Missouri-St. Louis (1997)  
Robert A. Stockland, University of Missouri-St. Louis (1998)  
Yahia Z. Hamada, University of Missouri-St. Louis (1999)  
Ricardo Delgado, University of Missouri-St. Louis (1999)  
Lin Yong Mao, University of Missouri-St. Louis (2001)  
Mesfin Janka, University of Missouri-St. Louis (2002).  
John Swearingen, University of Missouri-St. Louis (2004).  
Bingly Yan, University of Missouri-St. Louis (2005).  
Colin White, University of Missouri-St. Louis (2006).  
Hui Zhao, University of Missouri-St. Louis (2006)  
Mehda Kamat, University of Missouri-St. Louis (2006)  
Patamaporn Umnahanant, University of Missouri-St. Louis (2008)  
Ngamjit Praingam, University of Missouri-St. Louis (2009)  
Colin Rodger, University of Missouri-St. Louis (2010)

### **Dissertations Directed**

Francine L. Longcor "Studies of Some Cyclic Boronic Esters," Ph.D. Jan. 1984.

Pamela K. Rush "The Chemistry of Some Borane and Carborane Anion Salts," Ph.D. Aug. 1984.

Hong Fang "The Selective Synthesis and Structure of some bis[pentaboranyl(9)] Metal Complexes." Ph.D. Aug. 1996.

Paul McQuade "Interaction of Bidentate Phosphines with Boranes and Metallaboranes" Ph.D. Jan. 2001.

### **MS THESIS COMMITTEES**

Vincent Chang, University of Missouri-St. Louis (1979)  
Dorothea Bean, University of Missouri-St. Louis (1987)

**RESEARCH PUBLICATIONS** (All are either refereed or invited articles. Books and book reviews are identified as such).

1. L. Barton and D. Nicholls, "High Temperature Routes to Boron Monoxide and Diborane," Proceedings of the Chemical Society, 242 (1964).
2. L. Barton, S.K. Wason and R.F. Porter, "Thermochemistry of Interconversion of  $H_2B_2O_3(g)$  and  $H_3B_3O_3(g)$ ," Journal of Physical Chemistry, **69**, 2160 (1965).
3. L. Barton and D. Nicholls, "The Hydrogenation of Boron Monoxide to Diborane and the Reactions of Boron and Boron Carbide with Titanium and Zirconium Dioxide," Journal of Inorganic and Nuclear Chemistry, **28**, 1367 (1966).
4. L. Barton, C. Perrin and R.F. Porter, "Mass Spectrometric Study of Intermediates in the Oxidation of  $B_5H_9$ ,  $B_4H_{10}$  and  $BH_3CO$ ," Inorganic Chemistry, **5**, 1466 (1966).
5. L. Barton, F.A. Grimm and R.F. Porter, "Boroxine, A Simplified Preparation," Inorganic Chemistry, **11**, 2076 (1966).

6. F.A. Grimm, L. Barton and R.F. Porter, "A Vibrational Analysis of Gaseous Boroxine," Inorganic Chemistry, **7**, 1309 (1968).
7. L. Barton, "Boroxine: A Novel Approach to the  $\text{BH}_3\text{-PF}_3$  System," Journal of Inorganic and Nuclear Chemistry, **30**, 1683 (1968).
8. L. Barton and C.A. Heil, "Reaction of Germanium Dioxide with Graphite at High Temperatures," Journal of the Less Common Metals, **20**, 11 (1970).
9. L. Barton and G.T. Bohn, "Oxidation of Trimethylborane," Mass Spectral Evidence for the Intermediate  $(\text{CH}_3)_2\text{B}_2\text{O}_3$ ," Journal of the Chemical Society, Chemical Communications, **77**, (1971).
10. D.W. Wester and L. Barton, "Trimethylboroxine," Organic Preparations and Procedures-International, **3**, 191 (1971).
11. D.W. Wester, F. Longcor and L. Barton, "The Preparation and Characterization of 2-Methyl-1,3,2-dioxaborolane," Synthesis in Inorganic and Metal-Organic Chemistry, **3**, 115 (1973).
12. L. Barton and J.M. Crump, "Oxidation of 1,1-Dimethyldiborane: Isolation and Characterization of 2,5-Dimethyl-1,3,4-trioxadiborolane," Inorganic Chemistry, **12**, 2252 (1973).
13. L. Barton and J.M. Crump, "Oxidation of 1,1-Dimethyldiborane: Gas Phase Peroxide Intermediates," Inorganic Chemistry, **12**, 2506 (1973).
14. L. Barton, J.M. Crump and J.B. Wheatley, "Trioxadiborolanes from the Oxidation of Methyldiborane," Journal of Organometallic Chemistry, **72**, C1 (1974).
15. L. Barton, D. Brinza, R.A. Frease and F.L. Longcor, "Evidence for Aromaticity in Some Boron-Oxygen Heterocycles from NMR and Mass Spectral Measurements," J. Inorg. Nucl. Chem., **39**, 1945 (1977).
16. L. Barton, "(Oxy)hydroboranes and Related Species," Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 48, "Borverbindungen 16," 1 - 14 (1977)
17. L. Barton, "Tetrakis(organyloxy)diboranes (4) and Additional Diborane (4) Derivatives," Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 48, "Borverbindungen 16," 24 - 36 (1977).
18. L. Barton, "Oxygen-Boron-Nitrogen Heterocycles," Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 48, "Borverbindungen 16," 101 - 124 (1977).
19. L. Barton, T.P. Onak and S.G. Shore, "Species Containing Three Boron Atoms," in: Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 52, "Borverbindungen 18," 190-208 (1978).
20. L. Barton, T.P. Onak and S.G. Shore, "Hexaborane Species," in Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 54, "Borverbindungen 20," 52-79 (1979).
21. L. Barton and S.G. Shore, "Heptaborane and Octaborane Species," in Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 54, "Borverbindungen 20," 80-96 (1979).

22. L. Barton, T.P. Onak and S.G. Shore, "Nonaborane Species," in Gmelin Handbuch der Anorganischen Chemie, Erg-Wer, Vol 54, "Borverbindungen 20," 97-121 (1979).
23. L. Barton, T.P. Onak, R.J. Remmel and S.G. Shore, "Decaborane Species," in Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 54, "Borverbindungen 20," 122-209 (1979).
24. L. Barton, T.P. Onak, R.J. Remmel and S.G. Shore, "Species Containing 11 or 12 Boron Atoms," in Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 54, "Borverbindungen 20," 210-239 (1979).
25. L. Barton, T.P. Onak, "Species Containing More than 12 Boron Atoms," in Gmelin Handbuch der Anorganischen Chemie, Erg-Werk, Vol 54, "Borverbindungen 20," 240-304 (1979).
26. I. S. Jaworiskey, J.R. Long, L. Barton and S.G. Shore, "Directive Effects in Bridge Cleavage Reactions of Methyl-Substituted Boron Hydrides; Preparation and NMR Spectra of 3-CH<sub>3</sub>B<sub>6</sub>H<sub>11</sub>, 3-CH<sub>3</sub>B<sub>5</sub>H<sub>10</sub> and 1-CH<sub>3</sub>B<sub>4</sub>H<sub>9</sub>," Inorganic Chemistry, **18**, 56-61 (1979).
27. L. Barton, "Systematization and Structures of the Boron Hydrides," Topics in Current Chemistry, **100**, 169-206 (1982).
28. L. Barton, "The System Boron Hydrogen" Gmelin Handbuch der Anorganischen Chemie, 2nd Supplement, Vol 1, 3-204 (1983).
29. A.F. Berndt, L. Barton and F.L. Longcor, "2,3,5,6-Tetramethyl-1,4-Dioxane-2,5-diol, C<sub>8</sub>H<sub>16</sub>O<sub>2</sub>," Acta Crystallographica, **C39**, 395-397 (1983).
30. L. Barton and P.K. Rush, "Phosphine-Ligated Copper(I) Derivatives of Dicarbaheptaborane(8)," Inorganic Chemistry, **24**, 2413-20 (1985).
31. P.K. Rush and L. Barton, "Direct Synthesis and NMR Spectra of [(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>PCH<sub>2</sub>]<sub>2</sub>CuB<sub>5</sub>H<sub>8</sub>: Comments on the Solution Structure of 2,3-μ-Metallopentaboranes," Polyhedron, **4**, 1741-3 (1985).
32. L. Barton and P.K. Rush, "Formation of {1,1-[bis(diphenyl-phosphino)ethane]-2,3-dicarbonyl-nickel-closo-heptaborane} via the Intermediacy of 4,5(μ-halogeno[bis(diphenylphosphino)ethane]nickel-2,3-dicarbonyl-nido-hexaborane(8)," Inorganic Chemistry, **25**, 91-93 (1986).
33. L. Barton, "The Boron-Hydrogen System," Gmelin Handbook of Inorganic Chemistry, Boron Compounds, 3rd Supplement, Vol. 1, 2-241 (1987). Springer-Verlag, Berlin.
34. L. Barton, "The Formation of Bonds between Hydrogen and Elements of Group IIIB (B, Al, Ga, In, Tl)," in Inorganic Reactions and Methods, J.J. Zuckerman, Ed.; VCH Publishers Inc.: West Germany (1987) Vol. 2, Sect 1.7, pp. 124-148.
35. L. Barton, Book Review: "Inorganic Mass Spectrometry," Edited by: F. Adams, R. Gibjels, and R. Van Grieken. Wiley Inter-science, New York 1988, Journal of the American Chemical Society, **110**, 7266 (1988).

36. L. Barton, P.K. Rush, T. Zhu, P. Nevels, and M.H. Owens, "Reaction of Intermediate Sized Boranes with Methylidene-triphenylphosphorane," Inorganic Chemistry, **26**, 381-382, (1989).
37. L. Barton, Book Review: "Non-Metal Rings, Cages and Clusters," by: J. D. Woolins, John Wiley, New York 1988, Journal of the American Chemical Society, **111**, 5891, (1989).
38. L. Barton and D. K. Srivastava, "[PPh<sub>3</sub>]<sub>2</sub>CuB<sub>6</sub>H<sub>9</sub>Fe(CO)<sub>4</sub>: Rational Synthesis of a Heterobimetallaborane from Hexaborane(10)". Organometallics **10**, 2982-5, (1991).
39. L. Barton, "The Formation of Group VIB to Group IIIB Element Bonds from Group VIB-Hydrogen Bonds and Group IIIB - Sulfur and Selenium Bonds," in Inorganic Reactions and Methods, ed. J.J.Zuckerman, Verlag Chemie, West Germany. (1991) Vol. 5, Sect 3.5.3.4 - 3.5.4.3, pp. 270-278.
40. L. Barton and D. K. Srivastava, "1-Triphenylstannyl-*nido*-Pentaborane(9): An Example of <sup>119</sup>Sn-<sup>11</sup>B NMR Coupling in a Pyramidal Borane" Journal of the Chemical Society, Dalton Transactions. 1327-8, (1992).
41. D. K. Srivastava, N. P. Rath, and L. Barton, "Stoichiometric Removal of ligand from Copper(I) Reagents: A Novel Synthesis of Di- $\mu$ -bromo-tetrakis (methylidiphenylphosphine)-dicopper(I) and the Structures of [CH<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>P]<sub>3</sub>CuBr and {[CH<sub>3</sub>(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>P]<sub>2</sub>CuBr}<sub>2</sub>". Polyhedron **11**, 1251- 59 (1992).
42. D. K. Srivastava, N. P. Rath and L. Barton, "The Three Isomers of Triphenylstannyl-*nido*-pentaborane(9): Isolation and Structural characterization of 2,3- $\mu$ -(SnPh<sub>3</sub>)B<sub>5</sub>H<sub>8</sub>, 1-(SnPh<sub>3</sub>)B<sub>5</sub>H<sub>8</sub>, 1-(SnClPh<sub>2</sub>)B<sub>5</sub>H<sub>8</sub>" Organometallics **11**, 2263-73 (1992).
43. A. R. Khan, L. Barton, and V. T. D'Souza, "Heptakis-2,3-epoxy- $\beta$ -cyclodextrin, a Key Intermediate in the Synthesis of Custom-designed Cyclodextrins". Journal of the Chemical Society, Chemical Communications. 1112-1114 (1992).
44. D. K. Srivastava, N. P. Rath, L. Barton, J. D. Ragaini, O. Hollander, R. Godfroid and S. G. Shore "Structure and Spectra of 4,5- $\mu$ -(Tetracarbonyl)ironhexaborane(10), Fe(CO)<sub>4</sub>B<sub>6</sub>H<sub>10</sub> and its conjugate base [Fe(CO)<sub>4</sub>B<sub>6</sub>H<sub>9</sub>]" Organometallics **12**, 2017-24 (1993).
45. D. K. Srivastava, and L. Barton, "Organotin Derivatives of Hexaborane(10). Organometallics, **12**, 2864-68 (1993).
46. D. Srivastava, H. Fang, N. P. Rath and L. Barton, "Triphenylstannyl-derivatives of Pentaborane(9) and Hexaborane(10)," Current Topics in the Chemistry of Boron, G. W. Kabalka, Ed.; Special Publication. Royal Society of Chemistry, **143**, 310 - 313 (1994).
47. H. Fang, D. Zhao, L. Brammer and L. Barton, "Crystal and Molecular Structure of  $\mu$ ,2'-SnPh<sub>2</sub>(B<sub>5</sub>H<sub>8</sub>)<sub>2</sub> and  $\mu$ ,1'-SnPh<sub>2</sub>(B<sub>5</sub>H<sub>8</sub>)<sub>2</sub>: The First Structurally Characterized Examples of Two Pentaborane Cages Linked by a Single Heteroatom". Journal of the Chemical Society, Chemical Communications. 1531-33 (1994).

48. L. Barton, "The Boron-Hydrogen System," Gmelin Handbook of Inorganic Chemistry, Boron Compounds, 4th Supplement, Vol. 1a, 9-155 (1994). Springer-Verlag, Berlin.
49. L. Barton and D. K. Srivastava, "Metallaboranes" in Comprehensive Organometallic Chemistry, II, Wilkinson, G.; Abel, E. W.; Stone, F. G. A., Eds., Pergamon, **1995** Vol. 1, Ch. 8, pp. 275-373.
50. H. Fang, D. Zhao, N. P. Rath, L. Brammer and L. Barton, "Isomers of  $\text{SnPh}_2(\text{B}_5\text{H}_8)_2$ : Synthesis and Characterization of  $\mu, \mu'$ - $\text{SnPh}_2(\text{B}_5\text{H}_8)_2$ ,  $\mu, 2'$ - $\text{SnPh}_2(\text{B}_5\text{H}_8)_2$  and  $\mu, 1'$ - $\text{SnPh}_2(\text{B}_5\text{H}_8)_2$ ," Organometallics **14**, 1700 - 1711 (1995).
51. J. Bould, N. P. Rath and L. Barton, "{1,2- $[\eta^5\text{-(C}_5\text{Me}_5\text{)Ir}]_2\text{B}_5\text{H}_5$ }: Isolation and Structural Characterization of A *Closo*-polyhedral Metallaborane Cluster with a Capping BH Group". Organometallics **14**, 2119 - 2122 (1995).
52. J. Bould, N. P. Rath and L. Barton, "*Nido*- $[(\text{PPh}_3)_2(\text{CO})\text{Os}(\mu\text{-H})\text{Cp}^*\text{IrB}_3\text{H}_6]$ , *Closo*- $[(\text{PPh}_3)_2(\text{CO})\text{OsB}_4\text{H}_6\text{IrCp}^*]$  and *Pileo*- $[(\text{PPh}_3)(\text{CO})\text{HOsB}_5\text{H}_5\text{Ir}(\text{PPh}_3)_2\text{CO}]$ : A Unique Homologous Series of Iridaoscaborane Cluster Types" Journal of the Chemical Society, Chemical Communications. 1285-86 (1995).
53. J. Bould, N. P. Rath and L. Barton, "1,1,1-(CO)<sub>3</sub>-2,2,2-(CO)<sub>2</sub>(PPh<sub>3</sub>)-5-(PPh<sub>3</sub>)-*closo*-1,2-FeIrB<sub>5</sub>H<sub>4</sub>: The First Structurally Characterized *Closo*-heterobimetalloheptaborane System". Angewandte Chemie. **34**, 1641-43 (1995).
54. J. Bould, M. Pasieka, J. Braddock-Wilking, N. P. Rath, L. Barton and C. Gloeckner, "Synthesis of Heterobimetalloboranes and Related Species from  $[(\text{PPh}_3)_2(\text{CO})\text{OsB}_5\text{H}_9]$ : *Pileo*- $[(\text{PPh}_3)_2(\text{CO})\text{OsB}_5\text{H}_5\text{IrH}(\text{PPh}_3)(\text{CO})]$ , *Closo*- $[(\text{PPh}_3)_2(\text{CO})(\mu\text{-H})\text{OsB}_4\text{H}_5\{\eta^5\text{-(C}_5\text{Me}_5\text{)M}\}]$  (M = Rh, Ir), *Nido*- $[(\text{PPh}_3)_2(\text{CO})\text{Os}(\mu\text{-H})\{\eta^5\text{-(C}_5\text{Me}_5\text{)Ir}\}B_3\text{H}_6]$ , and *Nido*- $[(\text{PPh}_3)_2(\text{CO})\text{OsB}_4\text{H}_7(n\text{-C}_4\text{H}_9)]$ ." Organometallics. **14**, 5138-49 (1995).
55. J. Bould, N. P. Rath and L. Barton, "Synthesis and Characterization of *Nido*- $[1,1,2,2\text{-}(\text{CO})_4\text{-}1,2\text{-}(\text{PPh}_3)_2\text{-}1,2\text{-FeIrB}_2\text{H}_5]$ : A Heterobimetalloborane Analogue of *Nido*- $[\text{B}_4\text{H}_7]^-$ ," Inorganic Chemistry. **35**, 35-39 (1996).
56. D. L. Denton, R. A. Godfroid, L. Barton and S. G. Shore, "Preparation of an Edge-Bonded Metalladerivative of Hexaborane(10)" Inorganic Chemistry, **35**, 791-792 (1996).
57. P. Kaur, J. Holub, N. P. Rath, J. Bould, L. Barton, B. Štíbr and J. D. Kennedy, "Macropolyhedral boron containing cluster chemistry: Nineteen-vertex  $[\text{S}_2\text{B}_{17}\text{H}_{17}(\text{SMe}_2)_2]$ : An unusual apical boron atom of cluster connectivity six and a new polyhedral borane building block." Journal of the Chemical Society, Chemical Communications. 273 - 275 (1996).
58. Jonathan Bould, Nigam P. Rath, Hong Fang and Lawrence Barton. "Chemistry of the Hexaborane(10) Analogue  $(\text{PPh}_3)_2(\text{CO})\text{IrB}_5\text{H}_8$ : Formation and Characterization of the Heterobimetalloheptaboranes 1,1,1-(CO)<sub>3</sub>-2,2,2-(CO)<sub>2</sub>(PPh<sub>3</sub>)-4-(PPh<sub>3</sub>)-*closo*-1,2-FeIrB<sub>5</sub>H<sub>4</sub> and 2,2,2-(CO)(PPh<sub>3</sub>)<sub>2</sub>-7,7-Cl-(PMe<sub>2</sub>Ph)-*nido*-2,7-IrPtB<sub>5</sub>H<sub>7</sub>". Inorganic Chemistry. **35**, 2062 - 2069 (1996).

59. J. Bould, N. P. Rath, and L. Barton, "[ $(\text{CO})\text{H}(\text{PPh}_3)_2$ -*arachno*- $\text{OsB}_3\text{H}_8$ ]," Acta Crystallographica, **C52**, 1388 - 1390 (1996).
60. L. Barton, J. Bould, J. D. Kennedy and N. P. Rath. "Macropolyhedral boron-containing cluster chemistry. The isolation and characterisation of the eighteen-vertex *nido*-5'-iridaoctaborano-(3',8':1,2')-*closo*-4-iridadecaborane, [ $(\text{CO})(\text{PMe}_3)_2\text{IrB}_{16}\text{H}_{14}\text{Ir}(\text{CO})(\text{PMe}_3)_2$ ]" Journal of the Chemical Society, Dalton Transactions 3145 - 3149 (1996) .
61. R. Khan, L. Barton and V. T. D'Souza, "Epoxides of the Secondary Side of Cyclodextrins," Journal of Organic Chemistry, **61**, 8301 - 8305 (1996).
62. L. Barton, "The Boron-Hydrogen System," Gmelin Handbook of Inorganic Chemistry, Boron Compounds, 4th Supplement, Vol. 1b, 155pp (1996). Springer-Verlag, Berlin.
63. J. Bould, N. P. Rath and L. Barton, "Metallaborane Heteroatom Incorporation Reactions: Iridacarboranes, Iridathiaboranes and an Iridaazaborane from Iridanonaborane Precursors". Organometallics, **15**, 4915 - 4929 (1996).
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113. "The Structural Chemistry of the *Arachno*-Nonaboranes." L. Barton, J. Bould, R. Greatrex, J. D. Kennedy, D. L. Ormsby, M. G. S. Londesborough, K. L. F. Callaghan, M. Thornton-Pett, S. J. Teat, W. Clegg, H. Fang, N. P. Rath, and T. R. Spalding. Abstracts, *Boron Americas-VIII*, Death Valley, CA. Jan, 2002.
114. "Reactions of 11-vertex rhodathiaboranes and rhodadicarbaboranes with bidentate phosphines and their subsequent rearrangements." O. Volkov, R. Macias, N. P. Rath and L. Barton. Abstracts, *Boron Americas-VIII*, Death Valley, CA. Jan, 2002.
115. "Formation of Group IV transition metal derivatives of pentaborane(9) and a novel oxidative coupling reaction to form the new structural motif B<sub>9</sub>H<sub>11</sub>(PPh<sub>3</sub>)<sub>2</sub>." M. Hata, R. L. Thomas, N. P. Rath, L. Barton. Abstracts, *Boron Americas-VIII*, Death Valley, CA. Jan, 2002.
116. "A Novel Application of the Polyhedral Skeletal Electron Pair Theory to Borane Clusters." R. L. Thomas, N. P. Rath, W. Porterfield and L. Barton, Missouri Inorganic Day, UM-St. Louis, May 4, 2002.
117. "Reactions of boranes and metallaboranes with phosphines." Lawrence Barton, Oleg Volkov, Mitsuhiro Hata, Paul McQuade and Nigam P. Rath. Abstracts, *Eleventh International Meeting on Boron Chemistry*, Moscow, Russia, July 28-August 2, 2002.
118. "Formation of Bimetallaboranes using Rhodathiaborane and Rhodadicarbaborane templates." Oleg Volkov, Nigam P. Rath and Lawrence Barton, Abstracts, *Eleventh International Meeting on Boron Chemistry*, Moscow, Russia, July 28-August 2, 2002.
119. " Organometallic Chemistry on a Rhodathiaborane Cluster: Reactions with bidentate phosphines and organotransition metal reagents." Oleg Volkov, Ramon Macias, Nigam P. Rath and Lawrence Barton, Abstracts, 224<sup>th</sup> National Meeting, American Chemical Society, Boston, August, 2002.
120. "Formation of bimettallaboranes using rhodathiaborane or rhodadicarbaborane templates." Lawrence Barton, Oleg Volkov and Nigam P. Rath, Abstracts, 37<sup>h</sup> Midwest Regional Meeting, American Chemical Society, Lawrence, KS, Oct. 23 – 25, 2002.

121. "Reactions of boranes and metallaboranes with phosphines." Lawrence Barton, Oleg Volkov, Mitsuhiro Hata, Paul McQuade and Nigam P. Rath, Abstracts, 38<sup>th</sup> Midwest Regional Meeting, American Chemical Society, Columbia, MO, Nov. 5 – 7, 2003.
122. "Symmetrical versus non-symmetrical cleavage of diborane when reacted with a base. Kristina Alderman, Grainne Biddlecombe and Lawrence Barton, Undergraduate Research Symposium, UM-St. Louis, April, 23, 2004.
123. "Formation of group 4 transition metal derivatives of small boranes and novel borane coupling reactions. Rhodri Ll. Thomas, Mitsuhiro Hata, Nigam P. Rath, Grainne Biddlecombe and Lawrence Barton, Abstracts, *Boron Americas-IX*, San Marcos, TX. May, 2004.
124. "Another look at the *nido*-undecaborane system. O. Volkov, K. Radacki, R. Ll. Thomas, N. P. Rath and L. Barton. Abstracts, *Euroboron-3*, Prague, Czech Republic, Sept 12 – 16, 2004.
125. "X-ray Crystallography: An Essential Tool for the Study of Complex Derivatives of Boranes" X-ray Crystallography Open House, UM-St. Louis Chemistry Department, August 17, 2005
126. "The structure of the *nido*-undecaborate anion" L. Barton, O. Volkov, R. Ll. Thomas, K. Radacki and N. P. Rath, Abstracts, 230<sup>th</sup> National Meeting, American Chemical Society, Washington, DC, August, 2005.
127. "Formation and chemistry of hybrid metallaboranes and phosphines. Lawrence Barton, Mitsuhiro Hata, Paul McQuade, Rudolph E. K. Winter and Nigam P. Rath. Abstracts, *Twelfth International Meeting on Boron Chemistry*, Sendai, Japan, Sept. 2005.
128. "Boron Hydride and Related Chemistry and the Influence of Sheldon Shore", *The Shore Diamond Jubilee Symposium*, Ohio State University, Columbus Ohio, Oct. 8-9 (2005).
129. "Bidentate phosphine-borane complexes as chelating or bridging ligands" Lawrence Barton, Nigam P. Rath, Paul McQuade, Oleg Volkov and Mitsuhiro Hata, Abstracts, 40<sup>th</sup> Midwest Regional Meeting, American Chemical Society, Joplin, MO, Oct, 26 – 28, 2005.
130. "Hybrid metallaboranes and phosphines." Lawrence Barton\*, Mitsuhiro Hata, Paul McQuade, Rudolph E. K. Winter and Nigam P. Rath. Abstracts, BORAMX, San Juan, Puerto Rico, Aug. 2006.
131. "Small cage metallaborane chemistry and the influence of Sheldon Shore", Lawrence Barton. Abstracts, 233<sup>rd</sup> National Meeting, American Chemical Society, Chicago, March 2007.

## INVITED SEMINARS AND LECTURES

The University of Missouri-St. Louis, April, 1966  
 St. Louis University, November 1966  
 The University of Missouri-St. Louis, December, 1966  
 The University of Missouri-St. Louis, February 1969  
 The University of Missouri-Rolla, April 1970  
 The University of Missouri-St. Louis, August 1970  
 The University of Missouri-St. Louis, July 1973  
 Education Topics Group, ACS, St. Louis Section, February 1976.  
 Southern Illinois University-Edwardsville, February 1977.  
 Ohio State University, October, 1977.  
 The University of Kentucky, Lexington, November, 1977  
 The University of Missouri-St. Louis, November, 1978

Eastern Illinois University, December, 1979.  
St. Louis University, November 1981.  
Illinois State University, Bloomington-Normal, November, 1984.  
Southern Illinois University, Commencement Discussion Panel, June 1985.  
The University of Missouri-St. Louis, November, 1985.  
Northeast Missouri State University, Kirksville, MO January, 1986.  
Southern Illinois University-Edwardsville, April 1986.  
History of Chemistry Club, SIU-Edwardsville, April, 1986.  
Engleman Institute II, Commencement Address, June, 1991.  
St. Louis Award Address, St. Louis Section, April 1991.  
The University of Missouri-St. Louis, January, 1992  
The University of Leeds, UK, February, 1992  
Strathclyde University, Glasgow, UK., March 1992  
The University of Liverpool, UK., March 1992.  
The Ohio State University, May 1992.  
Battelle, Pacific Northwest Laboratory, Richland, WA., July 1992.  
Purdue University, February, 1993  
University of Missouri-Kansas City, March, 1993  
Southeast Missouri State University, April 1993  
University of Texas-El Paso, April 1994  
Southern Methodist University, April 1994  
Michigan Technological University, April 1994.  
The University of Missouri-St. Louis, August, 1995.  
Eastern Illinois University, October, 1995.  
The University of Missouri-Columbia, February, 1996.  
Rock River Section, American Chemical Society, Northern Illinois University, March, 1996.  
St. Louis University, October 17, 1997.  
St. Louis Section, American Society of Brewing Chemists. February, 1998  
The University of Missouri-St. Louis, April 1998.  
Heriot-Watt University, Edinburgh, Scotland, April, 1998.  
Leeds University, Leeds, UK., April, 1998.  
The University of Loughborough, Loughborough, UK, April, 1998.  
The Ohio State University, February, 1999.  
Southeast Missouri State University, April 1999  
Invited Session Lecture, *X<sup>th</sup> International Conference on Boron Chemistry*, Durham, July 1999.  
Invited lecture in the Symposium, *Organic and Inorganic Synthesis via Boranes*, at the 217<sup>th</sup> National Meeting, American Chemical Society, New Orleans, Aug. 1999  
Northern Illinois University, March 6, 2000  
UM-St. Louis, March 20, 2000  
Invitation to present a Plenary Lecture, *XI<sup>th</sup> International Conference on Boron Chemistry*, Moscow, Russia, July. 2002.  
Invitation to present a lecture in the Symposium *Recent Developments in Inorganometallic Chemistry* at the 224<sup>th</sup> National Meeting, American Chemical Society, Boston, Aug. 2002.  
Invitation to present a Keynote Lecture at the *XII<sup>th</sup> International Conference on Boron Chemistry*, Sendai, Japan, Sept. 2005.  
Invitation to speak at the The Shore Diamond Jubilee Symposium, Ohio State University, Oct 8/9, 2005  
The University of Minnesota-Duluth, December 2005.  
The University of Missouri-St. Louis, 2006.  
ACS Inorganic Chemistry Award Symposium, Chicago, March 2007

## RESEARCH GRANTS FUNDED

### External

1. "High Temperature Transpiration Studies," Submitted to the Petroleum Research Fund of the American Chemical Society, May 1967, Type G grant, awarded September 1, 1967. \$5,000 funded for 2 years.
2. "Oxidation of Some Group IIIA and IVA Alkyls and Hydrides," \$37,000 for 27 months. Submitted to the NSF, ONR and the Army Research Office (Durham). September 1968. \$28,100 awarded by the NSF for two years, June 1, 1969. (NSF GP 11211).
3. NSF grant G.P. 11211 extended to August 31, 1973 with conversion indirect costs to direct costs.
4. Travel award to attend IMEBORON IV, Salt Lake City Utah, July 1979. ACS-P.R.F. \$200.00 awarded.
5. "Studies of Transition-metal Complexes containing Main Group Element Ligands" NSF. Instrumentation Proposal for an Infrared Spectrometer (Co-investigator with inorganic chemistry colleagues) \$22,090.00 funded. 1983.
6. "Purchase of an NMR Spectrometer," NSF Chemical Instrumentation Program, December 1984 \$140,000 funded, Aug. 15, 1985. Departmental Proposal, PI.
7. NSF - Research Experiences for Undergraduates, \$60,000 February 1987, L. Barton contributor. Funded 5/7/87, \$31,000.
8. NSF - Purchase of a Mass Spectrometer, February 1988, \$153,366 (Funded 5/19/88). Departmental Proposal, PI.
9. NSF - Purchase of a CD/ORD Spectropolarimeter, July 1988, \$83,333 (Funded 11/88). Departmental Proposal, PI.
10. Missouri Research Assistance Act - "Borane and Metallaborane Chemistry of Some B<sub>6</sub> and B<sub>7</sub> Systems". Funded Nov 1989, \$9,711. These funds matched a \$19,422 grant from the Monsanto Co.
10. Missouri Research Assistance Act - "Borane and Metallaborane Chemistry of Some B<sub>6</sub> and B<sub>7</sub> Systems". Funded Nov 1990, \$5,289. These funds matched a \$10,578 grant from the Monsanto Co.
11. NSF - Research Experiences for Undergraduates, \$100,000, 4/1/92 - 3/31/95. L. Barton contributor.
12. "Novel Metallaborane Chemistry," National Science Foundation, \$105,000, funded for three years, July 1993 July 1996.
13. "Purchase of an X-ray Diffractometer," NSF Chemical Instrumentation Program, Submitted, Jan. 1993, \$150,000 funded, Jan 1994. Departmental Proposal, PI.
14. Purchase of an NMR Spectrometer," NSF Chemical Instrumentation Program, Submitted, July. 1993, \$160,000 funded, Jan 1994. Departmental Proposal, PI.
15. NSF - Research Experiences for Undergraduates, Special Creativity Award Renewal, \$114,000, 4/1/95 - 9/30/97, L. Barton contributor.
16. "New Directions in Metallaborane Chemistry," ACS-PRF, \$50,000 funded. June 1996 - May 1998.

17. "Purchase of a High Resolution Mass Spectrometer," NSF Chemical Instrumentation Program, Submitted, Jan 1997, \$250,000 funded, July 1997. Departmental Proposal, PI.
18. "Metallaborane Chemistry, From Small Heterobimetallaboranes to Large Metallaheteroboranes", NSF, \$223,000 funded, March 1998; extended through Nov 2002.
19. Upgrade of a 300MHz NMR Spectrometer, National Science Foundation (CHE-9974801, \$150,694, 1999) (LB Co-investigator, Spilling PI).
20. "The Chemistry of Larger Polyhedral Borane Clusters" NSF International Collaboration award. Submitted, Oct. 1999, \$12,000 funded for three years, March 2000; extended through April 2004.
21. Upgrade of a CCD-based X-ray Diffraction Laboratory, National Science Foundation, \$126,619.00, November 2004 - October 2007, \$126,619.00, Funded, Co-I.

### Internal

1. "Reactions of PF<sub>3</sub>(g) and NH<sub>3</sub>(g) with Boroxine," Summer 1967. \$1,500 awarded.
2. "High Temperature Chemistry," Summer 1968. \$1,600 awarded (includes Fellowship \$900 and \$700 research grant).
3. "Oxidation of Some Group IIIA and IVA Alkyls and Hydrides," Summer Fellowship and Grant awarded 1969. Subsequently withdrawn on the award of the NSF grant.
4. "Transient Intermediates in the Oxidation of the Lower Boranes and Organo-derivatives of the Lower Boranes," Summer Fellowship funded 1973.
5. "Oxidation of Boranes: A Novel Approach to the Classification of Boranes," Summer Fellowship, funded 1975
6. "Synthesis and Reactions of Some Novel Boron-Oxygen Ring Systems," Dec. 1979. Summer Fellowship, funded, 1980
7. "Novel Metallaborane Chemistry," April 1980, UM-St. Louis Weldon Spring Award, \$13,200 - funded.
8. Multinuclear NMR Spectra, \$750.00 obtained from the Intercampus Doctoral Activities Fund awarded May 1983. Proposal for an additional \$642 submitted Sept. 1983; Awarded Sept. 15, 1983.
9. UM-St. Louis, Grant Incentive Proposal, "Synthesis of Some New Metallaborane Clusters," March 1986, \$5,750 funded.
10. UM-St. Louis, Improved Research Quality Proposal, "Boronation of  $\beta$ -Cyclodextrin". Fall 1989, \$1,836.00 funded.
11. UM-St. Louis, Improved Research Quality Proposal, "Tin-substituted Pentaboranes(9)". Fall 1991, \$5,380.00 funded.
12. UM-St. Louis, Research Incentive Award, "Metallaboranes based on Hexaborane(10)," \$7,188, funded, Winter 1993.
13. Missouri Research Board, "Heterobimetallaboranes based on Hexaborane(10)," \$18,300, funded Sept. 1993.

14. UM-St. Louis, Research Incentive Award, "Metallaboranes based on Pentaborane(9) and Hexaborane(10)," \$2,500, funded, Winter 1994.
15. UM-St. Louis, Research Incentive Award, "New Directions in Metallaborane Chemistry," \$3,000, funded, Fall 1995.
16. UM-St. Louis, Small Grants Award, "Travel to International Boron Chemistry Conferences," \$750, funded, Fall 1995.
17. Missouri Research Board, "New Directions in Metallaborane Chemistry," \$32,600, funded June. 1996.
18. UM-St. Louis, Small Grants Award, "Purchase of Hardware for the XRD Facility" \$1,350, funded, Winter 1997 (with N. P. Rath).
19. UM-St. Louis, Research Leave, funded March 1998, for Winter 1999.
20. UMSL Small Grants Program. Travel to International Boron Conference, \$600, **funded** Dec. 1998.
21. UMSL Research Award Application, "Metallaborane Chemistry", \$5,200, Feb. 1999, **funded** Feb. 1999.
22. Missouri Research Board, " Degradation Mechanisms in Metallaborane Clusters," \$34,500, **funded** April. 2000.
23. "Formation of Novel Complexes of Phosphine Boranes with Transition Metal Organometallic Reagents". UMSL Research Award, Feb. 2001. \$12,500, **funded**.
24. UMSL Small Grants Program. Travel to *Boron Americas VIII*, \$807, **funded** Nov. 2001.
25. UM-St. Louis Research Award, Metallaheteroborane Cluster Chemistry, \$10,450, March 2003.
26. UMSL Small Grants Program. Travel to *IME Boron, XII*, \$1,000, Sendai, Japan. **funded** April. 2005.

### **Industrial Grants**

Several industrial grants and contracts were awarded to the department at my instigation when I was chair between 1980 and 1988 - ca. \$750,000.

### **TEACHING EXPERIENCE**

1. Prior to joining UM-St. Louis
  - (1) Demonstratorship, Inorganic Chemistry, University of Liverpool, (1961-1964)
  - (2) Part-time Instructor, Introductory Physics, University of Central Lancashire, Preston, UK (1962-63)
  - (3) Occasional lectures, Cornell University, as replacement in 1965-66.
2. At the University of Missouri-St. Louis

General Chemistry (non-majors)

General Chemistry Laboratory (non-majors)  
Introductory Chemistry I and II (majors)  
Quantitative Analysis  
Introduction to the Chemical Literature  
Basic Inorganic Chemistry  
Senior Undergraduate Seminar  
Inorganic Chemistry I (required of BS majors)  
Inorganic Chemistry II (senior undergraduate and beginning graduate students)  
Inorganic Reactions (senior level lab course)  
Instrumental Analysis (mass spec portion)  
Typical Element Chemistry (graduate students)  
Coordination Chemistry (graduate students)  
Special Topics in Inorganic Chemistry (graduate course on cluster chemistry)  
Problem Seminar in Inorganic Chemistry (graduate course)  
External Speaker Seminar

3. At Washington University

Inorganic Chemistry I

## SERVICE

### A. University Committees (Asterisk\* indicates I served as chair)

#### Department

Executive Committee\*  
Curriculum Committee\*  
Catalog and Publicity Committee\*  
Group Proposals Committee\*  
Graduate Policy Committee\*  
Graduate Admissions Committee\*  
Library Committee  
Search Committees  
High School Liaison  
Public Relations Coordinator\*)  
Advising Coordinator  
ACS Students Affiliates Advisor.  
Ad Personam Committees\*  
External Affairs Committee\* (current)  
Alumni Relations Coordinator\* (current)  
Editor, UMSL CHEMIST, 1984- present (current)  
Chair, Murray Lecture Committee (current)

#### College of Arts and Sciences.

Ad Hoc Curriculum Committee  
Planning Committee\*  
Nominating Committee  
Advising Committee\*  
Honors Committee  
Policy Committee  
Associate Dean Search Committee  
Development Officer Search Committee  
Scholarship and Awards Committee\*

## **Graduate School**

Graduate Council (Secretary and Vice-chairman)  
Graduate Council Executive Committee  
Graduate Faculty Secretary  
Graduate School Nominating Committee\*  
Graduate School Curriculum Committee\*

## **University Senate**

Member of Senate.  
Curriculum and Instruction Committee.\*  
Executive Committee.  
Invited member of the Faculty Council Steering Committee which met regularly with the Chancellor in the 1970s.  
Nominating Committee.  
Research and Publications Committee.  
Elections Committee.  
University Relations Committee.\*  
Physical Facilities and General Services Committee.\*  
Committee on Appointments, Promotion and Tenure.

## **Faculty Senate and University Assembly**

Chair, Faculty Senate and University Assembly  
Chair, Steering Committee, Faculty Senate and University Assembly.  
Steering Committee  
Budget and Planning Committee  
Committee on Committees  
Committee to consider issues of tenure removal  
University Relations Committee  
Academic Advisory Committee

## **Campus**

University Student Affairs Committee.  
Science Complex Planning Committee.  
Research Leave Committee.  
Advisory Committee-Health Related Studies Center.  
Miscellaneous Ad Hoc committees.  
Media Relations Committee.  
Engineering Study Committee.  
Faculty Advisory Board-Center for Science and Technology.  
Search Committee-Associate Vice Chancellor for Research and Graduate Studies.  
Search Committee-Vice Chancellor for Administrative Services.  
Campus review Committee-System-wide University Planning Council.  
Engineering-Program Implementation Committee.  
Campus Committee on University Relations.  
Center for Molecular Electronics Building Committee.  
Center for Molecular Electronics Steering Committee.  
Fiscal Oversight Committee.  
Search Committee-Safety and Risk Management Assistant.  
Search Committee-Director of Facilities Management.  
Benton/Stadler Halls Remodeling Committee.  
2000 Committee.  
Chancellor's Committee on Academic Review, Facilitator, Physics Department Review Team.

Chancellor's Committee on Academic Review, Facilitator, Center for Neurodynamics Review Team.  
Search Committee, Vice Chancellor for University Relations.  
Search Committee, Vice Chancellor for Student Affairs  
Space Committee  
Chancellor's Cabinet  
Search Committee, Director of Alumni Relations  
Strategic Planning Committee  
Chancellor's Award for Staff Excellence 2001, 2002  
Faculty Grievance Panel member 2002 – 2006  
40<sup>th</sup> Anniversary Celebration Planning Committee.  
Chancellor Search Committee 2003  
Campus Review Committee – University relations  
Campus review Committee – Faculty Senate and University Assembly

### **Other Campus**

Member Alumni Association Governing Board (current)  
Distinguished Alumni Award Selection Committee

### **UM-System Wide**

Committee on Access to Engineering in Urban Areas  
Intercampus Weldon Spring Review Committee.  
Missouri Research Assistance Act Review Committee.  
Presidential Award for Research, Review Committee, 1999.  
Inter-campus Faculty Council 2000 - 2002

## **B. Service to Chemistry and Professional Organizations**

### **American Chemical Society**

#### **National Level**

Councilor, 1990-2016  
Bylaw Councilor, 2017  
Membership Affairs Committee, Associate - 1991, Member - 1992-1997, Secretary, 1992-93.  
Session chairman, ACS National Meeting, Denver, 1993, Washington 1994, New Orleans, 1999  
Local Section Activities Committee, Member – 1998 – 2004.  
Senior Chemists Taskforce. 1999 – 2001  
Membership Affairs Committee - liaison to the Budget and Finance Committee  
Local Section Activities Committee – Liaison to the Divisional Activities Committee  
Elected to Committee on Committees, 2005 – 2010.  
Committee on Committees, Liaison to the Committee on Chemical Safety and to the Committee on PROJECT SEED, 2005 – 2010  
Meetings and Expositions Committee, 2011.  
Elected to Council Policy Committee, 2012 – 2017.  
Recognized as a Fifty Year Member, 2015.  
Senior Chemists Committee, Associate, 2019 -

#### **Midwest Region**

Session Chairman, Midwest Regional Meeting 1967, 1992, 1994, 1997.  
Symposium Chairman, *Rings, Cages and Clusters of the Main Group Elements*, Midwest Regional Meeting 1979, St. Louis, MO.

Program Chairman, Inorganic Chemistry Division, ACS Midwest Regional Meeting, 1974, 1975, 1997.

Exposition Chair, Midwest Regional Meeting, 2000, St. Louis, MO

Liaison to National Office, Midwest Regional Meeting, 2011, St. Louis, MO

### **St. Louis Section**

Subcommittee Chairman, Continuing Education 1972-74

Education Committee Chair and Voting Member of the Board of Directors 1973-75

St. Louis Award Jury 1975, 1977, 1978

Conant Award Jury 1976

High School Chemistry Contest Organizer 1976, 1977

Member, Board of Directors, 1977-79; 1981-89, 1993 - present.

Steering Committee Chairman -1979

Steering Committee member, 1980, 1981, 1996, 1997, 1998.

Alternate Councilor, 1979-81

Nominations Committee Chairman (1979)

Chairman - elect 1979

Chairman - 1980

Midwest Award Jury, 1983-89, 1992-98

Member Special Committee to Review the Midwest Award 1987

St. Louis Award Symposium Chairman 1980, 1983, 2000, 2005, 2006, 2007, 2009 (co-chair).

National Society Councilor - 1990 - present.

High School Career Day Organizer, 1993 - 1998, 2000.

Section Historian, 2000 – present

### **Royal Society of Chemistry**

Member since 1060

President, Liverpool University Student Chemical Society, 1960-61

Honorary Member since 2014

### **Professional Refereeing.**

Referee for various periodicals including *Journal of the American Chemical Society*, *Organometallics*, *Inorganic Chemistry*, *Inorganica Chimica Acta*, *Czechoslovakian Chemical Communications*, *Main Group Metal Chemistry*, *Synthesis and Reactivity in Inorganic and Organometallic Chemistry*, and *Applied Organometallic Chemistry*. Evaluation of grant applications for the National Science Foundation, Petroleum Research Fund and Research Corporation.

### **Other**

Session Chairman, Fourth Boron USA Workshop, Syracuse, N.Y. July (1994), BUSA-V-MEX, Guanajuato, Mexico, May, (1996), Boron in the Americas IX, San Marcos, TX, May (2004).

Member, National Organizing Committee, Boron-USA (BUSA) Workshops.

Co-chair, Boron in the Americas XI, St. Louis, MO, 2008.

Member Awards Committee BUSA, now BORAM, 2006 - present

President - St. Louis Research Council (1983-85, 1994-95)

Secretary - St. Louis Research Council (1993-94)

Member - Chemical industrial laboratory technician, advisory committee - St. Louis School District, 1980s.

Member site organizing committee, 1988 Annual Meeting, Council for Chemical Research; Chairman, MASUA, Chemistry Department Chairs Conference, 1986

Co-Chair, ACS, Cooperative Education Conference, UM-St. Louis, 1983

Member site organizing committee, 1997 Annual meeting, Council for Chemical Research

Member Awards Committee, Council for Chemical Research, 1996-97.

### **Review Panels**

Member of a three-person review panel for the 5-year evaluation of the department of chemistry and biochemistry at Southern Illinois University-Carbondale, 1982.

Member of a three-person review panel for the 5-year evaluation of the department of chemistry at the University of Missouri-Kansas City, 1993

Member of NSF-SBIR Research Panel on Nanotechnology, Sept 2002.

Consultant (remunerated) for NREL-DOE Hydrogen Storage Program, 2007.

### **C. Community and Other Service**

Member, Governing Board, Glen Echo Country Club 2012-2014, Secretary 2013.

Member, Board of Trustees - Glen Echo Park, Missouri 1981-2015. Served as Chair for three years and the rest of the time year as Village Clerk.

Chairman - Normandy High School - Viking Parents Organization, 1981-1988.

Normandy School District, Special Task Force Member, 1984, 1987.

Normandy Municipal Council, Member, Board of Directors 1987-90, Vice-President, 1988-1990.

Member Political Advisory Committee, Metropolitan Transit Authority, Bi-state Development Agency, 1989-92.

Delegate to Normandy Communities Forum, Partnership 2000.

Member, St. Louis Regional Commerce and Growth Focus Group on Science and Technology 1997.

### **Awards for Community Service**

Normandy Municipal Council, President's Award for Outstanding Community Service 1985

Normandy Area Historical Association, Certificate of Appreciation, February 1986.