

CURRICULUM VITAE

Name: Kenneth A. Martin
Address: Department of Chemistry
Point Loma Nazarene University
3900 Lomaland Drive
San Diego, CA 92106
Phone: 619.849.2329
Fax: 619.849.3452
Email: kenmartin@pointloma.edu

Education: 1973-77 Ph.D., Physical Chemistry, University of Kansas/Wichita State University
1970-73 M.S., Physical Chemistry, University of California-Davis
1966-70 B.A., Chemistry and Mathematics (double major), Pasadena College (Cum Laude)
PhD Dissertation: Phosphorescence Microwave Double Resonance Studies of Aromatic Aldehydes
Employment: 1990-present Professor, Department of Chemistry, Point Loma Nazarene University
1977-1990 Professor, Department of Chemistry, Gordon College

Major Committee Assignments:

Point Loma Nazarene University: Chemistry Department Chair (1999-2014); Chair of Faculty Governance Committee (2014-15); Chair Faculty Governance Task (2012-2014); Chair Non-Traditional Educational Platform Task Force (2010-2012); Faculty Representative to the Board of Trustees (2013-16); Academic Policy Committee (1994-96; 2004-07; 2009-11); Member and Chair, Campus-Wide Planning and Budgeting Committee (1995-97); Educational Programs Self-Study Committee (1994-96); Member and Chair, Faculty Council (1992-94 and 2006-2008); President's Ad Hoc Committee on Quality (1991-92); Strategic Planning Committee (2005-2008); and seven other standing and ad hoc committees.

Gordon College: Director, General Education Core Curriculum Program; Member, Academic Policy Committee; Member, Faculty Senate; Chair and Member, Core Curriculum Committee; Chair and Member, Field and Cooperative Education Committee

Membership 1973 - present American Chemical Society
1977 - present American Scientific Affiliation

Professional Publications:

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1. "The Effect of Enhanced Adlayer Ordering by 1-Chloroalkanes on the Energy Transfer from Naphthalene to 2-Ethyl-naphthalene on Al₂O₃ During Temperature Programmed Desorption", A.M. Nishimura, Rachel J. DeHoog, Melissa A. Shew, Xianzhang Geng, and **K.A. Martin**, *Journal of Undergraduate Chemistry Research*, **2015**, 14(1), 20.
 2. Xianzhang Geng, Karli R. Holman, K.A. Martin and A.M. Nishimura "Effect of a Homologous Series of Alkanes on the Disorder-to-Order Transition of Naphthalene on α -Alumina", *Journal of Undergraduate Chemistry Research*, **2015** 14, 68-73.

3. "Effect of 1-chlorohexane on the energy transfer from naphthalene to 2-methylnaphthalene on α -alumina during temperature programmed desorption", Rachel J. DeHoog, Melissa A. Shew, **K.A. Martin**, A.M. Nishimura*, *Trends in Physical Chemistry*, **2014**, 15, 1-11.
4. "Effect of water and methanol on the laser induced excimer fluorescence decay of 2-methoxynaphthalene on α -alumina during temperature programmed desorption", Rachel J. DeHoog, Melissa A. Shew, Nicole K. Grabe, **K.A. Martin**, A.M. Nishimura*, *Trends in Physical Chemistry*, **2014**, 15, 49-59.
5. "Effect of 1-Chloropentane on the Energy of Transfer from Naphthalene to 2,6-Dimethylnaphthalene on α -Alumina During Temperature Programmed Desorption", Melissa A. Shew, Rachel J. DeHoog, **K.A. Martin**, A.M. Nishimura*, *Journal of Undergraduate Chem. Res.*, **2014**, 13(3), 45-49.
6. "Effect of Water on the Laser Induced Excimer Fluorescence Decay of 2-Methylnaphthalene and Naphthalene on α -Alumina During Temperature Programmed Desorption", Melissa A. Shew, Rachel J. DeHoog, **K.A. Martin**, A.M. Nishimura*, *Journal of Undergraduate Chem. Res.*, **2014**, 13(2), 34-39.
7. "Effect of Simple Aliphatic Alcohol Thin Films on the Laser Induced Excimer Fluorescence Decay of Naphthalene on α -Alumina During Temperature Programmed Desorption", Nicole K. Garbe, Marcus B. Anthony, K.A. Martin, and A.M. Nishimura*, *Advances in Applied Physics*, 2013, Vol. 1, no. 4, 127-138, HIKARI Ltd.
8. "Effect of *cis*- and *trans*-decalin on the Laser Induced Fluorescence Decay of 2-Methylnaphthalene on α -Alumina During Temperature Programmed Desorption", Brandon D. Driver, Nicole K. Garbe, Marcus B. Anthony¹, K.A. Martin¹, and A.M. Nishimura*, *Journal of Undergraduate Chem. Res.*, **2013**, 12, 61-64.
9. "Effect of Simple Aliphatic Alcohols on the Laser Induced Fluorescence Decay of 2-Methylnaphthalene on α -Alumina During Temperature Programmed Desorption", Marcus B. Anthony¹, Brandon D. Driver, Nicole K. Grabe, K.A. Martin¹, and A.M. Nishimura*, *Journal of Undergraduate Chem. Res.*, **2013**, 12, 51-55.
10. "Temperature dependent excimer luminescence of naphthalenes on α -alumina". Samantha R. Gardner, Laura M. Selby, Rachel K. Teranishi, Michael S. Douglas¹, Seth W. Simonds¹, K.A. Martin¹, A.M. Nishimura*, *Journal of Luminescence*, 134(**2013**) 657-664
11. "Laser-Induced Fluorescence Decay of 2-Methyl-, 2-Methoxy-, and 2-Ethyl-naphthalene on α -Alumina during Temperature Programmed Desorption", Bradly B. Baer^{‡*}, Shanan Lau*, Hannah E. Ryan*, K.A. Martin[‡], A.M. Nishimura[‡], *Journal of Spectroscopy*, (**2013**) 959126
12. "Fluorescence Quenching by Resonant Energy Transfer" Bradly Baer[‡], K.A. Martin[‡], A.M. Nishimura^{*‡}, *The Chemical Educator*, **2013**, 18, 1-3
13. "Excimer of Naphthalenes in Solution and on Glass" Rachel K. Teranishi, Kenneth A. Martin[‡], and Allan M. Nishimura[‡], *The Chemical Educator*, **2012**, 17, 1-3

14. "Laser induced fluorescence resonance energy transfer of 9,10-dihydrophenanthrene and 9-fluorenone on alumina during temperature programmed desorption", Hannah E. Ryan*, Shanan Lau*, Bradly B. Baer†*, K.A. Martin‡, A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2012**, 11(4), 116-118.
15. "Laser induced fluorescence decay of 1-methyl-, 1-methoxy- and 1-ethylnaphthlene on alumina during temperature programmed desorption", Hannah E. Ryan*, Shanan Lau*, Bradly B. Baer†*, K.A. Martin‡, A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2012**, 11(4), 107-111.
16. "Effect of Water on the Excimer Fluorescence Decay Rate Constant of Naphthalene on α -Alumina", Hannah E. Ryan*, Shanan Lau*, Bradly B. Baer†*, K.A. Martin‡, A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2012**, 11(3), 90-93
17. "The Effect of Substitution on the Fluorescence Property on α -Alumina and its Application to Energy Transfer and Excimer Formation". Rachel K. Teranishi, Laura M. Selby, Samantha R. Gardner, Seth W. Simonds, Michael S. Douglas, K.A. Martin and A.M. Nishimura, " in *Naphthalene: Structure, Properties and Applications*, Nadya Gotsiridze-Columbus, ed., Nova Science Publishers, Inc., Hauppauge, NY (**2011**)
18. "Effect of Desorption of Alkanes on the Fluorescence of Methylnaphthalene on Al_2O_3 ", Rachel K. Teranishi*, Laura M. Selby*, Samantha R. Gardner*, Seth W. Simonds†*, Michael S. Douglas†*, K.A. Martin‡, A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2011**, 10(4), 185-190.
19. "ODMR Linewidth of 2-Indanone", Samantha R. Gardner*, K.A. Martin‡, A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2011**, 10(4), 199-203.
20. "Evidence of resonance energy transfer in molecular bilayers on Al_2O_3 (0001)", Samantha R. Gardner, Seth W. Simonds, K.A. Martin, A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, **2011**, 10(3), 95.
21. "Evidence of resonance energy transfer in molecular bilayers on Al_2O_3 (0001)", Samantha R. Gardner, Seth W. Simonds, K.A. Martin, A.M. Nishimura, *Journal of Luminescence*, **2011**, 131, 1661-1663.
22. "Observation of Resonance Energy Transfer in Naphthalene-Phenanthrene Molecular Bilayers on Al_2O_3 (0001)", Seth W. Simonds*†, Samantha R. Gardner*, K.A. Martin‡ and A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2011**, 10(1), 137-141.
23. "Observation of Resonance Energy Transfer in Dichlorobenzene-Fluorenone Bilayer on Al_2O_3 (0001)", Laura M. Selby*, Michael S. Douglas†*, K.A. Martin‡ and A.M. Nishimura†, *Journal of Undergraduate Chem. Res.*, **2011**, 10(1), 5-7.

24. "Perturbation in the Formation of Excimers in Methylanththalenes on Al₂O₃ (0001)" Michael S. Douglas^{‡*}, Laura M. Selby^{*}, K.A. Martin[‡] and A.M. Nishimura[†], *Journal of Undergraduate Chem. Res.*, **2010**, 9(4), 117.
25. "Energy Transfer in Mixed Excimers and Exciplexes on a Dielectric Surface" Christine L. Binkley^{*}, Nicole C. Freyschlag^{‡*}, Melissa L. Gross^{*}, Wendi A. Hale^{*}, Taylor C. Judkins^{*}, K.A. Martin[‡] and A.M. Nishimura[†], *Journal of Undergraduate Chem. Res.*, **2010**, 9(4), 122-127.
26. "1-Methylanththalene Excimers on a Dielectric Surface" Laura M. Selby^{*}, Michael S. Douglas^{‡*}, K.A. Martin[‡] and A.M. Nishimura[†], *Journal of Undergraduate Chem. Res.*, **2010**, 9(4), 128-132.
27. "Steric effect of methyl, methoxy, and ethyl substituents on the excimer formation of naphthalene on Al₂O₃(0001)" C.L. Binkley, T.C. Judkins, N.C. Freyshlag¹, K.A. Martin¹, A.M. Nishimura, *Elsevier Surface Science*, **2009**, Vol. 603, 2207-2209.
28. "Disubstitutional Effect on Naphthalene Fluorophores on Al₂O₃(0001)" Christine L. Binkley^{*}, Nicole C. Freyschlag^{*†}, Melissa L. Gross^{*}, Wendi Hale^{*}, Taylor C. Judkins^{*}, K.A. Martin[†] and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, **2009**, 8(3), 107-110.
29. "Thermally Induced Surface Dynamics of Dichloronaphthalene Excimers on Al₂O₃ (0001)" N.C. Freyschlag^{*}, M.L. Gross^{*}, W.A. Hale^{*}, R.D. Valladares^{*}, M.N. Masuno, K.A. Martin, and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, **2008**, Vol. 7(4), 122-125, ISSN# 1541-6003.
30. "Formation of Methoxynaphthalene-Naphthalene Exciplex on Al₂O₃ (0001)" C.L. Binkley^{*}, T.C. Judkins^{*}, K.A. Martin and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, **2008**, Vol. 7(4), 133-136, ISSN# 1541-6003.
31. "Formation of Molecular Clusters by Thermally Induced Persolation of Water Through Dimethylnaphthalene and Dimethoxynaphthalene Adlayers on AL₂O₃," M. L. Goss, M. C. Boatz, S. M. Ryland, R. D. Valladares, B. M. Murray, M. N. Masumo, K. A. Martin and A. M. Nishimura, *Journal of Undergraduate Chem. Res.*, **2008**, 7(1), 6-10.
32. "Formation of Naphthalene-Dicholoronaphthalene Exciplexes on Al₂O₃ (0001)" N.C. Freyschlag^{*‡}, M.L. Gross^{*}, W.A. Hale^{*}, R.D. Valladares^{*}, M.N. Masuno, K.A. Martin[†] and A.M. Nishimura[†], *Journal of Undergraduate Chem. Res.*, **2008**, 7(3), 83-86.
33. "Wavelength-Resolved Temperature Programmed Desorption of 1,4-Disubstituted Naphthalenes on Al₂O₃ (0001)" G.H. Allen, S.M. Ryland, K.A. Martin, and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, Vol. 4, pg. 165-168, 2006
34. "Determination of Spin-Spin Relaxation in 2-Indanone by Differential Saturation of the ODMR Lines", J.J. Burdett, D.F. Marten, K.A. Martin and A.M. Nishimura, *J. Journal of Undergraduate Chem. Res.* (4), 1-6 (2006).

35. "Surface Dynamics of 1,4-Dichloronaphthalene from Deposition to Desorption on Al₂O₃ (0001)", G.A. Allen, S.M. Ryland*, K.A. Martin and A.M. Nishimura *Journal of Undergraduate Chem. Res.*, (4), 153-157, 2006.
36. "Use of fluorescence to probe the surface dynamics during disorder-to-disorder transition and cluster formation in dihalonaphthalene-water thin films". D.R. Hoss, A.J. Bishop*, M.A. Evans, K.E. Howard, A.D. Louie, K.A. Martin and A.M. Nishimura *Thin Solid Films* 515, 1370-1376 (2006).
37. "Dynamics of Disorder-to-Order Transition in Bilayers: Formation of van der Waals Molecular Clusters by Percolation of Water Through a p-Dihalobenzene Adlayer on Al₂O₃(0001)" B.J. Haddock, S.L. Cowell, J.S. Brigham, T.S. LeDoux, J.G. Andre', C.A. Moore, E. Herndon, E.J. Neethling, C. Osborn, A.J. Bishop, L. Meiling, K.A. Martin and A.M. Nishimura, *Encyclopedia of Surface and Colloid Science*, A.T. Hubbard and P. Somasundaran editors. Marcel Dekker (2005) N.Y. pp. 1-21.
38. "Optical Studies of the Disorder-to-Order Transition in 1,4-Dichloronaphthalene Adlayer on Al₂O₃(0001)", J.S. Brigham, D.R. Hoss, A.J. Bishop, K.A. Martin, A.M. Nishimura *Journal of Undergraduate Chem. Res.*, 4(3) 101-105. (2005)
39. "Temperature Dependent Non-radiative Effects in the Disorder-to-order Transition in Cyclopentanone and Cyclohexanone Films on Al₂O₃ (0001)" T.S. LeDoux, J.M. Rea, K.A. Martin, A.M. Nishimura *Thin Solid Films*, 485, 267-273. (2005)
40. "Crystallization Kinetics of Cycloalkanone Thin-Films on Al₂O₃ (0001)", T. LeDoux, J. Brigham, K.A. Martin and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, 2003, 4, 135-139.
41. "Formation of Molecular Clusters by Percolation of Water Through p-Bromochlorobenzene Adlayer on Al₂O₃ (0001)", Brook Haddock, Lindsay Meiling, Stephanie Cowell, K.A. Martin and A.M. Nishimura, *Surface Science*, 2004, 569, 56-61.
42. "Use of Optical Interference to Determine Surface Coverage During Vacuum Deposition", J.S. Brigham, A.J. Bishop, T.S. LeDoux, J.M. Rea, K.A. Martin and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, 2004, 4, 169-171.
43. "Dynamics of Disorder-to-Order Transition in Bilayers: Formation of Van Der Waals Molecular Clusters by Percolation of p-Difluorobenzene through water adlayer on Al₂O₃(0001)", J.S. Brigham, A.J. Bishop, K.A. Martin and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, 2004, 4, 173-178.
44. "Interaction of Water and P-Dibromobenzene on Al₂O₃ (0001)." R.T. Gingerich, D.L. Arnold, KA Martin and A.M. Nishimura, *Journal of Undergraduate Chem. Res.*, 2003, 4, 173-177.
45. "Dynamics of Crystal Formation by Optical Detection: Multiple Disorder-to-Order Phase Transitions of Cycloalkanone Multilayers on Al₂O₃ (0001)." J.S. Santos, J.D. Taylor, R.T.

Gingerich, A.F. Cavallero, M.P. Hanchett, K.R. Pointer, A.S. Pontius, C.J. Sharpe, D.L. Arnold, A.M. Nishimura, and K.A. Martin, *Encyclopedia of Surface and Colloid Science*, Marcel Dekker, Inc., 2003.

46. , "Crystallization Kinetics of Benzophenone and Naphthalene Multilayers on Al₂O₃ (0001)," I.M. Rosbrugh, D.W. West, L.E. Pfeifer, N.M. Cook, D.M. Licata, K.A. Martin, A.M. Nishimura *Surface Science* , 2000 , 449, 248-254.
47. "Detection of Multiple Trap Sites in α -Deuterated 2-Indanone by Optically Detected Magnetic Resonance," S.A. Riley, L.S. Fifield, K. Brubaker, I. Rosbrush, D.F. Marten, K.A. Martin, A.M. Nishimura, *Journal of Luminescence*, 1998 , 78 , 179-186.
48. "A Program to Determine the Percent Total Deuteration in an Exchange Reaction," S.A. Riley, L.S. Fifield, K.A. Martin, A.M. Nishimura, *Chem. Edu.* , 1997 , 2 , 1430-4171.
49. "Dephasing in Spin-Echo in the Phosphorescent Triplet State of Crystalline 2-Indanone," K.L. Purvis, S.P. Wiemelt, T. Maras, M. Blue, V. Melkonian, P.D. Ashby, S.A. Riley, L.S. Fifield, K.A. Martin, and A.M. Nishimura, *J. Luminescence* , 1997 , 71 , 199-205.
50. "Electronic Energy Transfer in Benzophenone Adlayer," D. Bresenden, A.S. Carlson, P.J. Partain, G. Reynoso, B. Oudinarath, K.A. Martin, A.M. Nishimura, *J. Fluorescence* , 1995 , 5 , 377-381.

Before Coming to Point Loma (that is as a faculty member at Gordon College)

51. K.E., Kihlstrom, K.A. Martin, and A.M. Nishimura, "Effect of Adsorption on Thin Silver Films on the Triplet State of 4-Benzoylpyridine," *J. Phys. Chem.*, **1988**, 92, 2932-3.
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54. D.G. Frank, K.A. Martin, and A.M. Nishimura, "Optically Detected Magnetic Resonance of Several Aromatic Ketones Absorbed on Alumina," *J. of Phy. Chem.*, **1984** , 88, 2961.
55. Law, Kam S., N. Prasad Paras, K.A. Martin, and A.M. Nishimura, "Spin Coherence in Crystalline Complexes. Naphthalene: 2 (1, 4-Diiodotetrafluorobenzene)". *Chem. Phys. Lett.* , **1984** , 103 , 517.
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58. S.G. Hilburn, R.K. Power, K.A. Martin and A.M. Nishimura, "Spin Relaxation in the Phosphorescent Triplet State of Several Pyridyl Carbonyl Compounds," *Chem. Phys. Lett.*, **1983**, *100*, 29.
59. K.A. Martin, and A.M. Nishimura, "Coherence in the Phosphorescence Triplet State of Naphthalene in Dihalobenzenes," *Journal of Mol. Cryst. And Liq. Cryst.* , **1982**, 88, 1.
60. K.A. Martin, "Nuclear Power: Biblical Mandates and the Human Condition," *Journal of the American Scientific Affiliation*, **1980**, 32.
61. K.A. Martin, G. Moller and A.M. Nishimura, "A Study on the Solvent Effects on the Lowest Triplet State of Hydroxybenzaldehydes," *J. of Phys. Chem.*, **1976**, 80, 2788.
62. G.R. Brunk, K.A. Martin and A.M. Nishimura, "A Study of Solvent Effects on the Phosphorescence Properties of Flavins," *Biophysical Journal*, **1976**, 16, 1373.

As an undergraduate researcher at Pasadena College

63. "The Reactions of Methyl Hypobromite and Acetyl Hypobromite with Olefins" V.L. Heasley, C.L. Frye, G.E. Heasley, K.A. Martin, D.A. Redfield and P.S. Wilday (1970), *Tetrahedron Letters*, 18, 1573-1576.
64. "The Reactions of Hypochlorites with Olefins in Nitromethane" V.L. Heasley, G.E. Heasley, M.R. McConnell, K.A. Martin, D.M. Ingle and P.D. Davis (1971) *Tetrahedron Letters* 50, 4819-4822.

Presentations with Undergraduates--Oral and Poster:

49 Presentations from 1976 to present

Area of Research:

Research interests are in the general area of molecular spectroscopy. Most are conducted as collaborative projects with Dr. Allan Nishimura at Westmont College. The experimental methods fall into two broad categories.

The first area of research involves the spectroscopic study of energy transfer in thin organic films deposited on an Al₂O₃ surface. These studies are conducted under ultrahigh vacuum (UHV) conditions and in a temperature range from 100 K to 400 K.

The second area of research involves experiments that fall under the general heading of Optically Detected Magnetic Resonance (ODMR) techniques. In these experiments, optical signals are collected from a sample immersed in a liquid helium bath (~ 1.4 K) and excited with both UV and microwave radiation. Such studies detect subtle changes in the triplet state of excited aromatic compounds. These signals indicate changes in the local molecular environment.

These research efforts seek a better understanding of the dynamics of energy transfer within solid substances. Such processes are involved in catalysis, photosynthesis, and similar important phenomena. The research team is made up of me, Dr Nishimura, and undergraduate students from both our institutions.