

# HARDING KEITH McDOWELL

Retired Professor of Chemistry  
The University of Texas at Arlington

## **CAREER HIGHLIGHTS**

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As Vice Chancellor of Research and Technology Transfer for The University of Texas System, I was responsible for oversight of the research and commercialization activities of 9 academic universities and 6 health institutions. I have eight years experience as a mid-level manager at a national laboratory and twenty-seven years university experience as a faculty member, researcher and administrator with extensive success in creating new offices and associated infrastructures that significantly enhance operational capacity. This success results from strengths in facilitating effective partnerships among various groups around focused ideas for the maximum benefit. Defining examples include:

- Established the *Ignite Texas!* program that created the Texas Ignition Fund, an early-stage commercialization grant program that was funded for \$2M by the University of Texas System Board of Regents.
- Expanded the Office of Research and Technology Transfer in order to strengthen the commercialization and research compliance programs throughout the 15 University of Texas System institutions.
- Served as co-chair of the Texas Alliance for Nanotechnology to establish a collaborative federal laboratory in Texas.
- Founded 2 business incubators (Arlington, TX and Tuscaloosa, AL).
- Received the "Deal of the Year" Award by the Licensing Executives Society for the negotiation of a \$50M startup company as one of the first startup companies formed by The University of Alabama.
- Served as member of NSF taskforce entitled EPSCoR 2020 to plan future of EPSCoR program.
- Testified to a House appropriations committee in May, 2005 on behalf of the EPSCoR Coalition for an increase in the NSF EPSCoR budget. The FY06 appropriations bill was enacted with an increase from \$94.5M to \$100M.
- Served as an Alfred P. Sloan Fellow 1978-1981

## **EDUCATION**

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1972 Ph.D. in Chemical Physics, Harvard University, research advisor, Dr. Martin Karplus  
1966 B. S. in Chemistry, Wake Forest University

## **EMPLOYMENT**

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2007-2010 Vice Chancellor for Research and Technology Transfer, The University of Texas System  
2004-2007 Executive Director, Alabama EPSCoR  
2004-2005 Interim Dean of Engineering, The University of Alabama  
2003-2007 Vice President of Research, The University of Alabama  
2003-2007 Professor of Chemistry, The University of Alabama  
2001-2003 Vice President of Research and Information Technology, UT Arlington  
2000-2001 Dean of Graduate School, UT Arlington  
1999-2000 Associate Dean of Science, UT Arlington  
1991-1995 Chair of Chemistry and Biochemistry, UT Arlington  
1991-2003 Professor of Chemistry, UT Arlington  
1988-1991 Research Staff Member and CLS Technical Coordinator for Materials Chemistry and Physics  
1983-1988 Group Leader, Physical Chemistry Group (CLS-2), Los Alamos National Laboratory  
1981-1982 Sabbatical at Los Alamos National Laboratory  
1979-1982 Visiting Staff Member at Los Alamos National Laboratory  
1978-1983 Associate Professor of Chemistry at Clemson University  
1974-1978 Assistant Professor of Chemistry at Clemson University

## **LEADERSHIP ROLES**

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2009-2010	Texas Bioenergy Policy Council
2009-2010	Executive Board, APLU Council on Research Policy & Graduate Education
2008-2010	Advisory Board, FUSION Consortium
2007-2010	Member of APLU Commission on Innovation, Commercialization, and Economic Prosperity
2007-2009	Co-chair, Texas Alliance for Nanotechnology
2007	Member (invited), NSF Taskforce entitled EPSCoR 2020 to plan the future of the EPSCoR program
2005	Witness Testimony to the House Appropriations Committee on behalf of the EPSCoR Coalition; resulted in NSF EPSCoR budget increase from \$94.5M to \$100M.
2005-2007	Board of Directors, EPSCoR Coalition
2004-2005	Board of Trustees, National Institute for Global Environmental Change
2003-2007	Board of Directors, Mississippi-Alabama SeaGrant Consortium; Vice-Chair - 2005, Chair - 2006
2003-2007	Board of Directors, Space Science Technology Alliance in Alabama
2003	Advisory Board for North Texas Commission
2002-2003	Legislative Working Group, The University of Texas System
2002-2003	Leadership Council of Texas Health Research Institute, a division of Texas Health Resources
2001-2003	Strategic Leadership Council, The University of Texas System

## **RECENT MERITORIOUS ACTIVITIES**

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### *The University of Texas System*

- Established the *Ignite Texas!* Program that created the Texas Ignition Fund, an early-stage commercialization grant program that was funded for \$2M by the University of Texas System Board of Regents.
- Expanded and enhanced the U. T. System and Sandia National Laboratories interaction leading to funding of external joint grants of over \$100,000,000.
- Co-chair of the Texas Alliance for Nanotechnology to establish a collaborative federal or state laboratory in Texas.
- Expanded the Office of Research and Technology Transfer in order to strengthen the commercialization and research compliance programs throughout the 15 University of Texas System institutions.

### *The University of Alabama*

- Took over the Alabama EPSCoR program in 2004 as Executive Director. Reversed funding non-renewal for Alabama EPSCoR from the NSF Research Infrastructure Improvement (RII) program by rewriting the NSF RII proposal which was funded for \$6 million in Spring of 2005. As Executive Director, wrote the Katrina Relief Planning Grant that was funded in 2005 for \$200,000. Worked with Mississippi and Louisiana to obtain in 2006 a Katrina Forum grant from the NSF for \$99,990.
- As the first vice president for research at The University of Alabama, built the infrastructure for the Office of Research including such items as taking over the Animal Care Facility, forming the research compliance office, and restructuring the Central Analytical Facility.
- Created the Bama Technology Incubator housing three startup companies in 2007.
- Transformed the Alabama Institute for Manufacturing Excellence program and building into a center for innovation research.
- Formed an Office of Technology Transfer that has transformed the campus from almost no activity with respect to invention disclosures, patents and licensing to a respectable level of activity.
- Worked with central administration to remove the burden of charging out-of-state tuition differential from grants and contracts.
- Created a Council of Center Directors.

- Testified to a House appropriations committee in May, 2005 on behalf of the EPSCoR Coalition for an increase in the NSF EPSCoR budget. The FY06 appropriations bill was enacted with an increase from \$94.5M to \$100M.
- Responsible for working with the Alabama Congressional Delegation representing the university with respect to congressional funding actions.
- Served as member of NSF taskforce entitled EPSCoR 2020 to plan future of EPSCoR program.
- Worked with State Senator Steve French to obtain an increase of \$500,000 in the state appropriation for EPSCoR in FY07 to support an EPSCoR Graduate Research Assistant program.

#### *The University of Texas at Arlington*

- Worked with senior administration to obtain funding and build the Chemistry Research Building.
- Appointed as Dean of the Graduate School. Rebuilt Graduate School Office leading to a growth in the graduate program from approximately 3,800 graduate students to over 6,000 in three years while establishing online graduate admissions.
- Restructured the Office of Information Technology and managed approximately 100 permanent employees and 100 student helpers.
- Managed the startup of the NanoFab facility and nanotechnology program INSERT (Institute for Nanoscale Science and Engineering Research and Teaching).
- One of four founding members of SPRING (Strategic Partnership for Research in Nanotechnology), a major plus-up nanotechnology program from Congress (\$15M per year) involving UT Arlington, UT Austin, UT Dallas, Rice University and the United States Air Force.
- Worked with former Congressman Martin Frost and Congressman Joe Barton and their congressional offices to achieve the first ever congressional earmarks for UT Arlington; over \$5M was obtained in a two-year period from 2001 to 2003.
- Worked with the Chamber of Commerce and the City of Arlington, Texas to obtain funding from the US Department of Commerce to create the Arlington Technology Incubator.
- Worked with Team Arlington to form the Arlington Research and Technology Initiative that was presented by McDowell to congressional delegation and community and served as a basis for high technology economic development in Arlington, Texas.
- Managed a rapid upswing in research funding in FY02 with a 39% growth in both sponsored program awards and expenditures.
- Worked with dean of science at UT Arlington to build a major science education program in Texas and make UT Arlington the leader. For example, the College of Science rescued the Texas State Science Fair from collapse and rebuilt the statewide program.

#### *Los Alamos National Laboratory*

- Created Low-Earth Orbit Program with NASA JSC to study effects of oxygen atoms and other chemical species on space assets in low-earth orbit.
- As Group Leader, raised money and led efforts to build a surface science workstation at the Ion Beam Materials Laboratory (about \$400,000) and to build a new molecular beam system with surface science capabilities (about \$500,000).
- Participated in approximately 80 projects at various management levels that included collaborations with Stanford Synchrotron Research Laboratory and Brookhaven National Laboratory.

#### **FORMAL MANAGEMENT TRAINING (LOS ALAMOS NATIONAL LABORATORY)**

1. Course: Managing Interpersonal Relations, Wilson Associates, Mar. 20-21, 1986.
2. Course: Budgeting Concepts and Processes, Training Office, Dec. 5-6, 1985.
3. LANL Management Training Program, October 1984 to April 1985.
  - a. Time Management with Secretaries, Barbara Boehm, April 29-30, 1985.
  - b. Excel, William Scherer, April 18-19, 1985.

- c. Discussions with Sandia National Laboratory Senior Management and tour of Albuquerque DOE Operations Office, April 5, 1985.
- d. Discussions with LANL Senior Management, Feb. 28-Mar. 1, Mar. 14-15, April 4, 1985.
- e. Strategic Planning, Dan Slate, Feb. 13-14, 1985.
- f. Public Affairs, Pat Jackson, Jan. 31-Feb. 1, 1985.
- g. Technical Presentations, Ladonna Robson, Jan. 23, 1985.
- h. Public Speaking (Videotaping Sessions), Communispond (George Kops), Jan. 17-18, 1985.
- i. Project Management, Milton Rosenau, Jan. 3-4, 1985.
- j. Time/Stress Management, Barbara Boehm/Dan Rahder, Dec. 12-13, 1984.
- k. Managing the Unsatisfactory Performer, Barbara Boehm, Dec. 6-7, 1984.
- l. Motivation, Joe Champoux, Nov. 29-30, 1984.
- m. Team Building/Meeting Management, Barbara Boehm, Nov. 8-9, 1984.
- n. Understanding Communication, William Scherer, Oct. 25-26, 1984.
- o. Models for Management, Teleometrics, Oct. 9-12, 1984.
4. Course: Performance Appraisal, William Scherer, August, 1984.
5. Course: Nuclear Weapons Orientation, July, 1984.
6. Course: Project Management, Jim Bradford, Fall 1983.
7. Course: Basic Management for First Line Supervisors, William Scherer, July 15, 1983.

### ***FUNDING HISTORY***

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- \$1,875,000 for U. T. System Sandia Initiative
- \$2,000,000 for Texas Ignition Fund
- \$6,200,000 for Alabama EPSCoR Research Infrastructure Improvement Award from 2005-2008 at The University of Alabama
- \$441,200 for research support from 1992-2004 at UT Arlington (exclusive of administrative activities)
- Various research programs were funded totaling about \$5 million in operating monies and \$2 million in capital equipment monies as Group Leader at Los Alamos National Laboratory
- "Sabbatical Leave Grant", Los Alamos National Laboratory, 1981-1982, 12-month salary plus \$200 per month dislocation allowance
- \$31,500 for research support from 1975-1980 at Clemson University

### ***PUBLICATIONS (Selected from 65 peer-reviewed publications)***

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1. H. K. McDowell, "Quantum Generalized Langevin Equation: Explicit Inclusion of Nonlinear System Dynamics," J. Chem. Phys. 112, 6971 (2000).
2. T. Gayen, K. McDowell, and A. Burns, "Quantum Dynamics of Electron Transfer in a Molecular Segment with Phonon Interaction," J. Chem. Phys. 112, 4310 (2000).
3. D. Bailey, M. Hurley, and H. K. McDowell, "Dynamics in the Spin-Boson Model by Maximum Entropy Moment Imaging," J. Chem. Phys. 109, 8262 (1999).
4. H. K. McDowell and A. M. Clogston, "Molecular Timescale Generalized Langevin Equation Theory and Polynomial Maximum Entropy Imaging of Spectral Densities," J. Chem. Phys. 109, 8249 (1998).
5. A. M. Clogston, H. K. McDowell, P. Tsai, and J. Hanssen, "Davydov Soliton and Polarons," in Molecular Chains: Partial Hamiltonian Diagonalization," Phys. Rev. E 58, 6407 (1998).
6. H. K. McDowell, "Quantum Generalized Langevin Equation Approach to Multi-Dimensional Dynamics," in Modern Methods in Multidimensional Dynamics Computations in Chemistry, Ed. D. L. Thompson (World Scientific, 1998), p. 201.
7. H. K. McDowell and A. M. Clogston, "Maximum Entropy Imaging and Quantum Molecular Timescale Generalized Langevin Equation Theory," Chem. Phys. 211, 91 (1996).

8. H. K. McDowell and A. M. Clogston, "A Graphical Approach to Quantum Molecular Time Scale Generalized Langevin Equation Theory," *J. Chem. Phys.* 102, 9026 (1995).
9. A. M. Clogston, H. K. McDowell, and P. Tsai, "Maximum Entropy Approach in Molecular Timescale Generalized Langevin Equation Theory," *Chem. Phys. Lett.* 219, 274 (1993).
10. G. Mensing, A. L. Beyerlein, and H. K. McDowell, "Molecular Time Scale Generalized Langevin Equation Theory for Coupled Spin Systems," *J. Chem. Phys.* 99,487 (1993).

### ***PRESENTATIONS (Selected from 81 presentations)***

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1. "Stochastic Electron Dynamics", SWTCC, College Station, TX, Nov. 4, 2000.
2. "Stochastic Electron Dynamics", SWTCC, Lubboch, TX, Nov. 13, 1999.
3. "Nonlinear Generalized Langevin Equation," SWTCC, Denton, TX, Nov. 20, 1998.
4. "The Spin-Boson Model and Moment Imaging," 215th ACS National Meeting, Dallas, TX, March, 29 - April 2, 1998.
5. "Davydov Solitons in Biomolecular Systems," SWTCC, New Orleans, LA, Nov. 22, 1997.
6. "Davydov Solitons in Biomolecular Systems," APS Regional Meeting, Oct. 10, 1997 at UNT.
7. "Dynamics in the Spin-Boson Model by Maximum Entropy Moment Imaging," SWTCC at UTA, Nov. 14-16, 1996.
8. "Dynamics in the Spin-Boson Model by Maximum Entropy Moment Imaging," APS Regional Meeting, Oct. 11, 1996 at UTA.
9. "Nonlinear Langevin Equation and Dynamics," ACS Joint Southeast-Southwest Regional Meeting, Memphis, TN, 11-29-95 to 12-1-95.
10. "Reaction Bath Theory," Contributed Talk, SWTC, Galveston, TX, Nov. 10 - 11, 1995.

### ***AWARDS, SCHOLARSHIPS AND FELLOWSHIPS***

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2000	UT System Chancellor's Award for Excellence in Teaching
1978-1981	Alfred P. Sloan Fellow
1978	Tenured at Clemson University
1967, 1968	Harvard Teaching Fellow Award for excellence in teaching
1966-1971	NSF Traineeship at Harvard University
1966	Phi Beta Kappa
1966	Omicron Delta Kappa, honorary leadership fraternity
1965	Kappa Mu Epsilon, honorary math fraternity
1964	Gamma Sigma Epsilon, honorary chemistry fraternity, president of local chapter, 1964-1966
1964	NSF Undergraduate Research Participant
1962-1966	General Motors Scholarship at Wake Forest University
1962	Honorable mention in Westinghouse Science Talent Search
1961	NSF High School Fellow at the University of North Carolina at Chapel Hill

### ***MEMBERSHIPS***

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Phi Beta Kappa  
 Sigma Xi  
 The American Chemical Society  
 The American Physical Society  
 National Council of University Research Administrators