

DONG QIN

WORK ADDRESS

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EMPLOYMENT RECORD

ASSOCIATE DEAN FOR RESEARCH

School of Engineering, Washington University in St. Louis

AUGUST 2007 TO PRESENT

The focus of this position is to work with the Engineering School and the Office of the Vice Chancellor for Research to build research activities cross Departmental and School boundaries.

- Seek out opportunities for research center and training grants, and work with groups of faculty at Washington University, nationally, and internationally to prepare proposals.
- Seek out opportunities for Engineering - industry research collaboration.
- Be a member of the School of Engineering's master planning team to design and then manage the School's specialized research facilities, which will serve as a resource to faculty in Engineering and in other Schools.
- Bring visibility to the School's research activities.
- Develop the vision and seek out opportunities to secure funding for the School's undergraduate research programs.

ASSOCIATE RESEARCH PROFESSOR

Energy Environment, and Chemical Engineering, Washington University in St. Louis

AUGUST 2007 TO PRESENT

ASSOCIATE DIRECTOR AND PRINCIPAL RESEARCH SCIENTIST

Center for Nanotechnology, University of Washington

AUGUST 2002 TO JUNE 2007

FACILITY MANAGER AND SENIOR RESEARCH SCIENTIST

Nanotech User Facility, Center for Nanotechnology, University of Washington

AUGUST 1998 TO AUGUST 2002

Responsible for the development of a self-sustaining and centralized cost facility, acquisitions of the state-of-the-art equipment, and implementation of training procedures.

MAJOR ACCOMPLISHMENTS

- Initiated and established Washington University Engineering as a new node for the NSF-supported National Nanotechnology Infrastructure Network (NNIN) in 2008.
- Established NTUF at the Center for Nanotechnology (CNT) in 1998 and elevated it to one of the nodes in the NSF-sponsored NNIN in 2004.
- Played an essential role in the development of the first doctoral degree program in Nanotechnology at the University of Washington.
- Created collaborative research environment beyond departmental boundaries and stimulated synergetic contribution from 73 faculty members from ten participating departments and three colleges – Arts and Sciences, Engineering, and Medicine at UW.
- Demonstrated a leadership role in formulating an active staff team by hiring and defining responsibilities to staff in support of dynamic research and education programs in the Center.
- Participated federal grant applications and directed site visits with the involvement of stakeholders including graduate students, faculty members, department chairs, deans, and vice provost.

EDUCATION BACKGROUND

MASTER IN BUSINESS ADMINISTRATION (MBA)
University of Washington, Seattle, WA

OCTOBER 2001 TO JUNE 2003

RESEARCH ASSOCIATE
Department of Bioengineering, University of Washington
Advisor: Professor Paul Yager
Research Area: Microfluidics for Biological Applications

JANUARY TO AUGUST 1998

POSTDOCTORAL FELLOW IN MATERIALS CHEMISTRY
Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA
Advisor: Professor George M. Whitesides
Research Area: Rapid Prototyping, Soft Lithography, and Adaptive Elastomeric Optics

JANUARY 1996 TO DECEMBER 1997

PH.D. IN PHYSICAL CHEMISTRY
Department of Chemistry, University of Pennsylvania, Philadelphia, PA
Advisor: Professor Hai-Lung Dai
Thesis: Time-Resolved Fourier Transform Emission Spectroscopic Studies of Highly Vibrationally Excited Molecules

SEPTEMBER 1990 TO DECEMBER 1995

B.S. IN CHEMISTRY
Department of Chemistry, Fudan University, Shanghai, P. R. China
Thesis: Laser Spectroscopy of SF₆

SEPTEMBER 1986 TO JULY 1990

RESEARCH EXPERTISE

ANALYTICAL TOOLS FOR NANOSCALE SCIENCE
Scanning Probe Microscopy (AFM, LMF, MFM, and STM)
Electron Microscopy (SEM and EDS)
Optical Microscopy (Near Field Microscopy, Raman Microscopy, and Confocal Microscopy)

MICRO- AND NANO-SCALE FABRICATION
Microfabrication (Soft Lithography, Self-Assembly, Photolithography, Wet/Dry Etching/Deposition)
Nanofabrication (E-beam Lithography, Dip-Pen Lithography, AFM Lithography)

CHEMICAL PHYSICS
Laser Spectroscopy (Laser-Induced Fluorescence and Dispersed Emission Spectroscopy)
Fourier Transform Emission Spectroscopy (Time-Resolved IR Emission Spectroscopy)

MANAGERIAL SKILLS

- Lead the development and implementation of innovative and expanded capabilities that provide the University with a distinctive advantage in procuring major research and education funds.
- Independently apply extensive and diversified knowledge of scientific and engineering principles and business practices in broad areas of assignments.
- Develop unique approaches for conducting research coordination and collaboration that foster new areas of research.

GRANT ACTIVITIES

- PI of the WUSTL Node of NSF National Nanotechnology Infrastructure Network (noncompetitive renewal), \$2,500,000 (2009-2014)
- Co-PI of a DOE proposal, “Novel self-organized surfaces, substrates and nanocomposites: A knowledge-driven platform to engineer functional nanomaterials for SERS sensing and solar energy harvesting”, pending, 2008 (in collaboration with faculty in Physics and Energy, Environmental, and Chemical Engineering at WUSTL)
- Investigator of a pilot project on axon study using microfluidic devices to be supported by the Fidelity Foundation, pending, 2008 (in collaboration with faculty in the Hope Center for Neurological Disorders and Biomedical Engineering at WUSTL)
- Co-PI of an NSF-supported DMR – Biomaterials Proposal, “Spatially-Controlled Immobilization of Bioactive Molecules on Solid Surfaces”, at the University of Washington, \$130,717 (2007-2008)
- Key personnel for an NSF-supported program, National Nanotechnology Infrastructure Network (NNIN), at the University of Washington, \$5,000,000 (2004–2009)
- Key Personnel for an NSF-supported program, “IGERT Program in Nanotechnology”, at the University of Washington, \$2,700,000 (2000–2005)
- Key Personnel for an NSF and NCI supported IGERT, “Building Leadership for the Nanotechnology Workforce of Tomorrow”, at the University of Washington, \$3,200,000 (2005-2010)
- Co-PI of an NSF-supported program, “Northwest Nanotechnology Node: Advancing Nanotechnology Education for Workforce Development”, at the North Seattle Community College, \$99,940 (2006–2007)

PRESENTATIONS AND LECTURES

- Physical Chemistry Seminar, University of Washington, 1997
- Nanotechnology Seminar, University of Washington, 1998
- Soft Lithography for “Molecular Self Assembly at Interfaces”, University of Washington, 2002–2003
- Soft Lithography for “Application in Microfabrication”, University of Washington, 1999–2003
- Nanotechnology for Entrepreneurship Program, Business School, University of Washington, 2002–2005
- Soft Lithography Lecture for “Frontiers in Nanotechnology”, University of Washington, 2001–2006
- Invited Soft Lithography Lecture for ASME 4th Nano Training Bootcamp, Minneapolis, MN, 2006
- “Soft Lithography Enterprise at the University of Washington”, Harvard University, 2006
- “Soft Lithography: Rapid Prototyping of Patterns and Structures at Micro- and Nanoscale”, Energy, Environmental and Chemical Engineering, Washington University in St. Louis, 2007

PUBLICATIONS

1. Strong asymmetry induced $\Delta K_a=3$ transitions in CH_2 $b^1B_1 \rightarrow \tilde{a}^1A_1$ spectrum: A study by time-resolved Fourier transform emission spectroscopy
G. V. Hartland, W. Xie, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **97**, 7010 (1992)
2. Fourier transform dispersed fluorescence spectroscopy: Observation of new vibrational band in the $5,000 - 8,000 \text{ cm}^{-1}$ region of $\tilde{a}^1A_1 \text{CH}_2$
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **98**, 2469 (1993)
3. State-to-state rotational energy transfer and reaction with ketene of highly vibrationally excited $b^1B_1 \text{CH}_2$ by time-resolved Fourier transform emission spectroscopy
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **98**, 6906 (1993)

PUBLICATIONS

4. A characterization of the CH₂ \tilde{a}^1A_1 (1,2,0), (2,0,0), (0,5,0), (1,3,0) and CH₂ b^1B_1 (1,14,0), (0,18,0), (0,19,0) vibronic levels by Fourier transform dispersed fluorescence spectroscopy
D. Qin, G. V. Hartland, and H. L. Dai, *Journal of Molecular Spectroscopy*, **168**, 334 (1994)
5. Collisional energy transfer of highly vibrationally excited NO₂ monitored by time-resolved Fourier transform infrared emission spectroscopy
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **100**, 7832 (1994)
6. Observation of large vibration-to-vibration energy transfer collisions ($\Delta E > 3,500 \text{ cm}^{-1}$) in quenching of highly excited NO₂ by CO₂ and N₂O
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **101**, 8554 (1994)
7. Renner-Teller effect on the highly vibrationally excited bending levels of \tilde{a}^1A_1 CH₂
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **102**, 6641 (1995)
8. Intramolecular electronic coupling enhanced collisional deactivation of highly vibrationally excited molecules
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **102**, 8677 (1995)
9. Collisional energy transfer of highly vibrationally excited NO₂: The role of intramolecular vibronic coupling and transition dipole coupling mechanism
G. V. Hartland, D. Qin, and H. L. Dai, *Journal of Chemical Physics*, **107**, 2890 (1997)
10. A rapid prototyping method for generating patterns and structures with feature sizes larger than 20 micrometers
D. Qin, Y. Xia, and G. M. Whitesides, *Advanced Materials*, **8**, 917 (1996)
11. Elastomeric binary phase gratings for measuring acceleration, displacement, strain and stress
J. A. Rogers, D. Qin, O. J. A. Schueller, and G. M. Whitesides, *Review of Scientific Instruments*, **67**, 3310 (1996)
12. Microcontact printing with a cylindrical rolling stamp: a practical step toward automatic manufacturing of patterns with submicrometer-sized features
Y. Xia, D. Qin, and G. M. Whitesides, *Advanced Materials*, **8**, 1015 (1996)
13. Non-photolithographic methods for fabrication of elastomeric stamps for use in microcontact printing
Y. Xia, J. Tien, D. Qin, and G. M. Whitesides, *Langmuir*, **12**, 4033 (1996)
14. Replica molding using organic polymers: A step toward manufacturing
Y. Xia, J. J. McClelland, R. Gupta, D. Qin, X.-M. Zhao, and G. M. Whitesides, *Advanced Materials*, **9**, 147 (1997)
15. Fabrication of polymeric structures with high aspect ratios using shrinkable polystyrene films
X.-M. Zhao, Y. Xia, D. Qin, and G. M. Whitesides, *Advanced Materials*, **9**, 251 (1997)
16. Elastomeric Light Valve
D. Qin, Y. Xia, and G. M. Whitesides, *Advanced Materials*, **9**, 407 (1997)
17. Microfabrication, microstructures, and microsystems
D. Qin, J. A. Rogers, Y. Xia, and G. M. Whitesides, *Topics in Current Chemistry*, **194**, 1 (1998)
18. The use of electroless silver as the substrate in microcontact printing of alkanethiols, and its applications in microfabrication
Y. Xia, S. Venkateswaran, D. Qin, J. Tien, and G. M. Whitesides, *Langmuir*, **14**, 363 (1998)

PUBLICATIONS

19. Photolithography with transparent reflective photomasks
D. Qin, Y. Xia, A. J. Black, and G. M. Whitesides, *Journal of Vacuum Science and Technology B*, **16**, 98 (1998)
20. Fabrication of microstructures using shrinkable polystyrene films
X.-M. Zhao, Y. Xia, O. J. A. Schueller, D. Qin, and G. M. Whitesides, *Sensors and Actuators B*, **8**, 917 (1998)
21. Crystallization of mesoscale particles over large areas
S. H. Park, D. Qin, and Y. Xia, *Advanced Materials*, **10**, 1028 (1998)
22. Assembly of nanoparticles into opaline structures over large areas
B. Gates, D. Qin, and Y. Xia, *Advanced Materials*, **11**, 466 (1999)
23. Beam redirection and frequency filtering with transparent elastomeric diffractive elements
B. A. Gryzbowski, D. Qin, and G. M. Whitesides, *Applied Optics*, **38**, 2997 (1999)
24. Formation of patterned microstructures of conducting polymers by soft lithography, and applications in microelectronic device fabrication
W. S. Beh, I. T. Kim, D. Qin, Y. Xia, and G. M. Whitesides, *Advanced Materials*, **11**, 1038 (1999)
25. Formation of patterned microstructures of polycrystalline ceramics from precursor polymers using molding in capillaries
W. S. Beh, Y. Xia, and D. Qin, *Journal of Materials Research*, **14**, 3995 (1999)
26. Microfabrication polymer devices for automated sample delivery of peptides for analysis by electrospray ionization tandem mass spectrometry
J. H. Chan, A. T. Timperman, D. Qin, and R. Aebersold, *Analytical Chemistry*, **71**, 4437 (1999)
27. Fabrication of ordered 2-D arrays of micro- and nanoparticles using patterned self-assembled monolayers as templates
D. Qin, Y. Xia, B. Xu, H. Yang, and G. M. Whitesides, *Advanced Materials*, **11**, 1433 (1999)
28. Elastomeric optical elements with deformable surface topographies: applications to force measurements, tunable light transmission and light focusing
B. A. Gryzbowski, D. Qin, R. Haag, and G. M. Whitesides, *Sensors and Actuators A-Physical*, **86**, 81 (2000)
29. V-V energy transfer from highly vibrationally excited molecules through transition dipole coupling: A quantitative test on energy transfer from SO₂ to SF₆
D. Qin, G. V. Hartland, and H. L. Dai, *Journal of Physical Chemistry A*, **104**, 10460 (2000)
30. Collisional deactivation of highly vibrationally excited SO₂: A time-resolved FTIR emission spectroscopy study
D. Qin, G. V. Hartland, and H. L. Dai, *Zeitschrift für Physical Chemistry*, **214**, 1501 (2000)
31. A soft lithographic approach to the fabrication of highly ordered 2D arrays of magnetic nanoparticles on the surfaces of silicon substrates
Z. Zhong, B. Gates, D. Qin, and Y. Xia, *Langmuir*, **16**, 10369 (2000)
32. Surface patterning and its application in wetting/dewetting studies
Y. Xia, D. Qin, and Y. Yin, *Current Opinion in Colloid and Interface Science*, **6**, 54 (2001)
33. Light controlled molecular shuttles made from motor proteins carrying cargo on engineered surface
H. Hess, J. Clemmens, D. Qin, J. Howard, V. Vogel, *Nano Letters*, **1**, 235 (2001)

PUBLICATIONS

35. Solvent Assisted Molding in Capillary: Rapid Prototyping of Patterns and Structures at Micro- and Nano-scale, D. Qin and S. Pakala, *Small*, submitted.
36. Solvent Assisted Nano-Molding for PMMA Nanostructures as Plasmonic Sensors, D. Qin and S. Pakala, *Nano Letters*, in preparation.
37. Soft Lithography for Micro- and Nano-scale Patterning, D. Qin, Y. Xia, and G. M. Whitesides, *Natural Protocol*, in preparation

PATENTS

1. Elastomeric light valve
D. Qin, Y. Xia, and G. M. Whitesides, US patent 6,304,364
2. Multiple patterned structures on a single substrate fabricated by elastomeric micro-molding techniques
J. P. Brody, K. Cabrera, A. Kamholz, D. Bell, D. Qin, and P. Yager, US patent, 6,039,897

REFERENCES

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