
Dr. William A. Ducker

Field of Specialization: Surface Chemistry: Surface Forces, Lubrication, Surface Organization, Atomic Force Microscopy, Stability of Colloids, Surfactants, Bacterial Adhesion, Antimicrobial coatings.

Professional Experience:

- 2008-present:* Professor, Department of Chemical Engineering, Virginia Tech
- 2005-2008:* Professor, ARC Federation Fellow, Department of Chemical & Biomolecular Engineering, University of Melbourne, Australia.
- 2003-2005:* Professor, Department of Chemistry, Virginia Tech
- 2001-2003:* Associate Professor, Department of Chemistry, Virginia Tech
- 1998-2001:* Assistant Professor, Department of Chemistry, Virginia Tech
- 1997:* Tenured Lecturer, University of Otago, New Zealand
- 1994-1997:* Lecturer, Department of Chemistry, University of Otago, New Zealand
- 1991-1993:* Postdoctoral Researcher, Department of Chemical and Nuclear Engineering and Materials Department, University of California, Santa Barbara
- 1987-1991:* Ph.D. student, Department of Applied Mathematics, Research School of Physical Sciences and Engineering, Australian National University, Canberra, Australia
- 1990-1991:* Consultant, Rohm and Haas, Australia
- 1988-1990:* Visiting Scientist, Materials Science, IBM, T. J. Watson Research Center, New York

Research Highlights:

- Developing coatings that inactivate SARS-CoV-2.
- Developing and understanding antibiofilm activity of topographic interfaces.
- Understanding of flow-boundary conditions at solid–gas interfaces.
- Validation of no-slip boundary condition for fluid flow in nanometer-scale geometry, and accurate measurement of lubrication forces in aqueous solution.
- Experimental proof of existence of nanobubbles
- Development of method to graft peptides from solids.
- Understanding of the role of dynamic adsorption in colloidal stability.
- Elucidation of the structure and forces occurring in surface aggregates of surfactant molecules.
- Determination of correlations between forces acting on individual particles, and the rheology and consolidation of many-particle systems.
- Development of method for measuring the forces on colloidal particles.

Academic Qualifications:

B.Sc. (Hons), First Class, Australian National University, Australia, December, 1986
Ph.D. Australian National University, June, 1992

Research Grants:

CURRENT (USD)

Petroleum Research Fund \$110,000 9/1/2019 –8/31/2021
PI: William Ducker
Diffusion in Nanoscale Cracks

National Science Foundation \$382,994 07/01/19–06/31/2022
PI: William Ducker
Adsorption in Confined Films

PREVIOUS

A. Since 2008 in USA

Commonwealth Research Commercialization Fund (State of Virginia) \$99, 704 07/01/15-06/30/17
PI: William Ducker; Co-PI: Joseph Falkinham
Novel Coatings to Prevent Bacterial Colonization of Medical Implants

Revalerio, \$217,500 10/1/12 – 6/30/16
PI: William Ducker
Nanobubbles: Effects of Solution Preparation
The objective is to understand and characterize the properties of nanoscale bubbles adsorbed to solid-liquid interfaces.

Institute for Critical and Applied Technology (Virginia Tech), \$60,000 07/01/2015 – 06/30/16
PI: Scott Huxtable; Co-PI: William Ducker
Thermal Diodes and Transistors for Energy Conservation
The object was to build and study thermal diodes.
(No Indirect Costs)

National Science Foundation, \$774,490 01/01/10 – 12/31/12
PI: William Ducker
MRI-R²: Development of a Correlation force microscope
The objective was to build a new device that could measure the mechanical properties of single molecules.

Petroleum Research Fund, \$100,000 07/01/09 – 06/30/12
PI: William Ducker
Direct Measurement of the Force between Neutral Dipolar Materials Induced by External Electrostatic Fields
The objective was determine the magnitude of forces that were induced on colloidal particles subject to an electric field.

National Science Foundation, \$300,000 07/01/08 – 06/30/12
PI: William Ducker
Non-Newtonian Fluids in Squeeze Films
The objective was to determine the lubrication forces that acted on colloidal particles.

B. 2005-2008 Australian

(in AUD, 1AUD ~USD0.75)

2005 ARC Federation Fellowship Biologically-Inspired Recognition and Processing in Colloidal Systems William Ducker	\$1,590,000
2005 ARC Linkage Infrastructure Equipment and Facilities Grant Materials and Surface Characterisation Facility Frank Caruso et al.	\$1,892,870
2006 ARC Discovery Project Artificial Proteins for the Control of Colloid and Surface Properties William A Ducker, Kevin E Van Cott, Richey M. Davis	\$690,000
2006 ARC Linkage Infrastructure Equipment and Facilities Grant Foundational National Nanotechnology Infrastructure Prof Kwok et al.	\$1,530,000
2006 Melbourne Research Grants Scheme Physical Chemistry of Protein Misfolding and Amyloid Formation William Ducker and David Dunstan	\$28,000
2006 ANSTO-UM Grants Scheme Zwitterionic polymers at the solid-liquid interface	\$26,000
2006 Artificial Peptides for Antibiofouling and Colloidal Processing Applications Australian Institute for Nuclear Science and Engineering (AINSE)	\$9400
2006 Artificial Peptides For Antibiofouling And Colloidal Processing Applications 2 Australian Institute for Nuclear Science and Engineering (AINSE)	\$9200
2007 Victorian State Government, Dept of Innovation Industry & Regional Development, Energy Technology Innovation Strategy Efficient and Practical Hydrogen Fuelled Vehicle Technologies, Michael Brear, William Ducker, Harry, Dragon Nesic	\$1,785,000
2007 ARC Discovery Project Controlling the Anisotropic Growth of Metal Oxide Crystals in Water via the Competitive Adsorption of Organic Molecules George Franks and William Ducker	\$300,000

C. USA 1998-2005

1998 Virginia Tech Aspires Grant Laboratory set-up William Ducker	\$33,000
9/98–9/01 National Science Foundation (DMR-987-1864) Preparation, Characterization, and Dynamical Properties of Nanostructured Metal-oxide Material Brian. Tissue, R. S. Meltzer; W. M. Dennis, and William Ducker	\$531,000
1/99–12/01 Jeffress Foundation Role of Counterion Specificity for Adsorbed Surfactant Structure	\$35,000

William Ducker	
9/99–8/01 National Science Foundation (CMS-9980770) Enzyme-assisted Nanometer-scale modification of Semiconductor Chip Surfaces, William Ducker and Michael Calter	\$520,000
9/99–8/01 National Science Foundation (BES-0086876) Monodisperse Block Copolymers for Environmentally-Friendly Processing of Aqueous Metal Oxide Suspensions Richey Davis, Kevin van Cott, William Ducker, and Christopher Russell	\$199,977
8/01–7/03 Petroleum Research Fund Adsorption as the Determinant of Surface Forces and Colloidal Stability William Ducker	\$90,000
10/8/02-8/9/05 National Science Foundation Proximal Adsorption in Colloidal Systems William Ducker	\$311,000
8/1/02-7/31/05 National Science Foundation Development of a Colloidal Force-Distance-Adsorption Apparatus for Particle Science Research and Education. William Ducker and John Walz	\$472,080
8/1/02-7/30/03 Virginia Tech Aspires Ellipsometry for Adsorption Measurements William Ducker, Richey Davis, Kevin van Cott, Aaron Goldstein, Alan Esker, and Mark Anderson	\$69,000
4/1/02-3/31/04 Unilever Research Probing Micromechanical Properties of Adsorbed Surfactants and Polymer Coatings William Ducker	\$144,356
3/02-3/05 Department of Energy Direct Measurement of Forces in Flotation Systems William Ducker and Roe-Hoan Yoon	\$200,000
2005 National Science Foundation Grant Gas Filtration using Carbon Nanotubes Eva Marand and William Ducker	\$70,000
D, New Zealand 1994-1998 (In NZD In the period 1994–1997, \$NZ1 was in the range \$US0.55–\$US0.70)	
1994 Otago Research Grant Investigation of Intermolecular and Surface Forces William Ducker	\$60,000
1994 New Zealand Lottery Science Grant Investigation of Intermolecular Forces in Colloidal Systems William Ducker	\$30,000
1994 Otago Equipment Committee	\$25,000

Partial purchase of Atomic Force Microscope William Ducker	
1995 Otago Research Grant Study of Plant Cell Walls Laurie Melton, David Burritt, William Ducker	\$46,000
1995 Otago Research Grant Stability of Marine Colloids Keith Hunter, William Ducker	\$10,000
1997-2000 Otago Research Grant Structure of Plant Cell Walls, Laurie Melton, David Burritt, William Ducker	\$30,000
1/99–1/01 Marsden Fund Stability of Marine Colloids Keith Hunter and William Ducker	\$270,000

TOTAL: Approx 11 Million

Journal Editorial Boards

Section Editor, Colloids and Interfaces 2016-
Section Editor, Current Opinion in Colloid and Interface Science 2016-
Editorial Advisory Board, Langmuir 2016-2019

Publications in Refereed Journals

131 papers in refereed journals
Google Scholar (December, 2020), 12,138 citations, h-index: 51

Accepted

132. Hosseini, M; Chin, A.; Behzadinasab, S; Poon, L. ; Ducker, W. A. A Surface Coating that Rapidly Inactivates SARS-CoV-2. *ACS Applied Materials & Interfaces*

Published

131. Behzadinasab, S.; Chin, A.; Hosseini, M.; Poon, L., ; Ducker, W. A. A Surface Coating that Rapidly Inactivates SARS-CoV-2. *ACS Applied Materials & Interfaces* **2020**, *12*, 34723–34727.

<https://doi.org/10.1021/acsami.0c11425>

130. Effect of Topographical Steps on the Surface Motility of the Bacterium *Pseudomonas aeruginosa*, Chang, Y.R.; Weeks, E. R.; Daniel Barton, D; Dobnikar, J.; Ducker, W. A., *ACS Biomaterials and Engineering*, **2019**, *5*, 6436–6445.

<https://pubs.acs.org/doi/pdf/10.1021/acsbiomaterials.9b00729>

129. Removal of Bacteria from Solids by Bubbles: Effect of Solid Wettability, Interaction Geometry, and Liquid–Vapor Interface Velocity, Kriegel, A. T.; Ducker, W. A., *Langmuir*, **2019**, *35*, 12817–12830

<https://pubs.acs.org/doi/pdf/10.1021/acs.langmuir.9b01941>

128. The Electrostatic Screening-Length in Concentrated Salt Solutions, Gaddam*, P.; Ducker, W. A. , *Langmuir*, **2019**, *35*, 5719–5727.

<https://pubs.acs.org/doi/pdf/10.1021/acs.langmuir.9b00375>

127. Adsorption at Confined Interfaces, Gaddam , P.; Grayson, P. R.; Ducker, W. A., *Langmuir*, **2018**, *34*, 10469–10479 <https://pubs.acs.org/doi/abs/10.1021/acs.langmuir.8b01418>

126. Impact of surface topography on biofilm formation by *Candida albicans*, Lagree, K.; Mon, H. H.; Mitchell, A.H. Ducker. W. A. *Plos One.*, **2018**, *13*, e0197925.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0197925>

125. Surface Topography Hinders Bacterial Surface Motility, Chang, Y. R.; Weeks, E. R.; Ducker, W.A., *ACS Applied Materials and Interfaces*, **2018** *10* (11), 9225–9234.

<https://pubs.acs.org/doi/10.1021/acsami.7b16715>

124. Effects of Colloidal Crystals, Antibiotics, and Surface-bound antimicrobials on *Pseudomonas aeruginosa* Surface Density, Mon, H.; Chang, Y.-R. ; Ritter, A. L. ; Falkinham, J. O.; Ducker, W. A. *ACS Biomaterials Science and Engineering.*, **2018**, *4*, 257-265.

<https://pubs.acs.org/doi/10.1021/acsbiomaterials.7b00799>

123. Fabrication of Stabilized Colloidal Crystal Monolayers, Chan, Y.-R.; Taylor, S.; Duncan, S. Mazilu, D.A., Ritter, A. L., *Colloids and Surfaces A*, **2017**, *514*, 185–191.

<https://www.sciencedirect.com/science/article/pii/S0927775716309967>

122. A liquid-state thermal diode, Gaddam, P.R.; Huxtable, S.T.; Ducker, W. A., *International Journal of Heat and Mass Transfer*, **2017**, *106*, 741-744.

121. Dynamics of single-stranded DNA tethered to a solid, Radiom, M.; Paul, M. R.; Ducker, W.A. *Nanotechnology*, **2016**, *27*, 255701.

<https://iopscience.iop.org/article/10.1088/0957-4484/27/25/255701/meta>

120. Colloidal Crystals Delay Formation of Early Stage Bacterial Biofilms, Kargar, M.; Chang, Y.R. Hoseinabad, H.K.; Pruden, A.; Ducker, W.A. *ACS Biomaterials Science & Engineering*, **2016**, *2*, 1039-1048.

119. Forces between extended hydrophobic solids: Is there a long-range hydrophobic force? Mastropietro and Ducker, *Current Opinion in Colloid & Interface Science*, **2016**, *22*, 51–58.
<https://www.sciencedirect.com/science/article/pii/S1359029416300103>

118. Phase State of Interfacial Nanobubbles, Seo, D.; German, S. R.; Mega, T. L.; Ducker, W.A., *Journal of Physical Chemistry C*, **2015**, *119*, 14262-14266. <https://pubs.acs.org/doi/abs/10.1021/acs.jpcc.5b04207>

117. Hydrodynamic Interactions between Two Nearly-Touching Brownian Spheres in a Stiff Potential: Effect of Fluid Inertia, Radiom, M.; Robbins, B.A.; Paul, M; Ducker, W.A., *Physics of Fluids* **2015**, *27* , 022002.

116. The Stochastic Dynamics Of Tethered Microcantilevers In A Viscous Fluid, Robbins, B.A. Radiom, M.; Ducker, W.A.; Walz, J.Y.; Paul, M. *Journal of Applied Physics*, **2014**, *116*, 164905.

115. Effect of Gas Species on Gas–Monolayer Interactions: Tangential Momentum Accommodation, Seo, D.; Ducker, W. A., *Journal of Physical Chemistry C*, **2014**, *118*, 20275–20282.
<https://pubs.acs.org/doi/abs/10.1021/jp503416x>

114. Preventing Bacterial Colonization using Colloidal Crystals Kargar, M.; Ducker, W. A. *J. Materials Chemistry B*, **2014**, *2*, 5962-5971.

113. Control of Gas Flow in Narrow Channels Using an Electric Field To Modify the Flow Boundary Condition, Seo, D.; Ducker, W. A., *Journal of Physical Chemistry C*, **2014**, *118*, 7480-7488.

112. Direct Measurement of Field-Induced Polarization Forces between Particles in Air, Chiu, C.-W.; Ducker, W. A. *Langmuir*, **2014**, *30*, 140-148.

111. Antimicrobial Surfaces Using Covalently Bound Polyallylamine, Dmitri D. Iarikov, D. D.; Kargar, M.; Sahari, A.; Russel, L.; Gause, K. T.; Behkam, B.; Ducker, W. A. *Biomacromolecules*, **2014**, *15*, 169–176.
<https://doi.org/10.1021/bm401440h>

110. In Situ Control of Gas Flow by Modification of Gas-Solid Interactions, Seo, D.; Ducker, W. A., *Physical Review Letters*, **2013**, *111*, 174502.
<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.111.174502>

109. Flow of Water Adjacent to Smooth Hydrophobic Solids, Bowles, A. P.; Ducker, W. A., *Journal of Physical Chemistry C*, **2013**, *117*, 14007-14013. <https://pubs.acs.org/doi/abs/10.1021/jp402553f>

108. The Influence of Interface Bonding on Thermal Transport through Solid–Liquid Interfaces, Harikrishna, H.; Ducker, W. A.; Huxtable, S. T. *Applied Physics Letters* **2013**, *102*, 251606.
<https://doi.org/10.1063/1.4812749>

107. Effect of Grafted Oligopeptides on Friction, Dmitri D. Iarikov, D. D.; Ducker, W.A, *Langmuir*, **2013**, *29*, 5760–5769.
<https://pubs.acs.org/doi/abs/10.1021/la4002225>

106. Gas Flows near Solids Coated with Thin Water Films, Seo, D. J.; Mastropietro, D.; Ducker, W. A. *Journal of Physical Chemistry C*, **2013**, *117*, 6235–6244.

105. Effects of surfactants on the formation and the stability of interfacial nanobubbles, Zhang, X. H.; Uddin, M. H.; Ducker, W. A.; Meada, N. *Langmuir*, **2012**, *28*, 10471–10477.

104. A Correlation Force Spectrometer for Single Molecule Measurements under Tensile Load, by Milad Radiom, Christopher D. F. Honig, John Y. Walz, Mark R. Paul and William A. Ducker, *Journal of Applied Physics*, 2013, **113**, 013503.
103. A Pressure Gauge based on Gas Density Measurement from Analysis of the Thermal Noise of an AFM Cantilever, Seo, D.; Paul, M. R.; Ducker, W. A. *Review of Scientific Instruments*, **2012**, *83*, 055005.
102. Selective Adsorption to Particular Crystal Faces of ZnO, Nicholas, N. J.; Ducker, W. A.; Franks, G. V. *Langmuir* **2012**, *28*, 7189-7196.
101. Differential Etching of ZnO Native Planes under Basic Conditions
Nicholas, N. J.; Ducker, W. A.; Franks, G. V. *Langmuir* **2012**, *28*, 5633-5641.
100. Forces Between Hydrophobic Solids in Concentrated Aqueous Salt Solution, Mastropietro, D.; Ducker, W. A. *Physical Review Letters* **2012**, *108*, 106101.
99. Rheology of Fluids Measured by Correlation Force Spectroscopy, Radiom, M.; Robbins, B.; Honig, C. D. F.; Walz, J.Y.; Paul, M. R. Ducker, W. A. *Review of Scientific Instruments*, **2012** *83*, 043908.
98. Correlations between the Thermal Vibrations of Two Cantilevers: Validation of Deterministic Analysis via the Fluctuation-Dissipation Theorem, Honig, C. D. F.; Radiom, M.; Robbins, B.; Walz, J.Y.; Paul, M. R. Ducker, W. A. *Applied Physics Letters* **2012**, *100*, 053121.
97. A deliberation on nanobubbles at surfaces and in bulk, Seddon, J. R. T.; Lohse, D.; Ducker, W. A. and Craig, V. S. J. *ChemPhysChem* **2012**
96. The Mechanism for Hydrothermal Growth of Zinc Oxide, Nicholas, N. J.; Franks, G. V.; Ducker, W. A. *CrystEngComm*, **2012**, *14*, 1232 – 1240.
95. Gas Flow near a Smooth Plate, Bowles, A.P.; Ducker, W.A. *Physical Review E*, **2011**, *83*, 056328.
94. No-Slip Boundary Condition for Weak Solid-Liquid Interactions. Bowles A.P.; Honig, C. D. F.; Ducker, W. A. *Journal of Physical Chemistry C* **2011**, *115*, 8613-8621.
93. Enantiospecific Wetting, Rapp M.; Ducker, W. A. *Journal of the American Chemical Society*. **2010**, *132*, 18051–18053.
92. Effect of Molecularly-Thin Films on Lubrication Forces and Accommodation Coefficients in Air, Christopher D. F. Honig and William A. Ducker *Journal of Physical Chemistry C*, **2010**, *114*, 20114–20119.
91. Hindered Rotation of Water near C₆₀ Wi, S.; Spano, J.; Ducker, W. A. *Journal of Physical Chemistry C* **2010**, *114*, 14986-14991.
90. Enantioselective Adsorption of Surfactants monitored by ATR-FTIR
Häbich, A; Qiao, G.G.; Ducker, W. A. *Langmuir*, **2010**, *26*, 13944-13953.
89. Lubrication forces in air and accommodation coefficient measured by a thermal damping method using an atomic force microscope Honig, C. D. F.; Sader, J. E. ; Mulvaney, P. E.; Ducker, W. A. *Physical Review E* **2010**, *81*, 056305.
88. Do Stable Nanobubbles Exist in Mixtures of Organic Solvents and Water?
Annette Häbich, William Ducker, Dave E. Dunstan and Xuehua Zhang
J. Phys. Chem. B, **2010**, *114* 6962-6967.
87. Formation of Nanodents by Deposition of Nanodroplets at the Polymer–Liquid Interface
Xuehua Zhang, Xiaoxuan Wei and William Ducker

Langmuir, **2010**, 26, 4776–4781

86. Complexity in Nanoparticle Assembly and Function by Direct-Grafted Peptides Mosse, W. K. J.; Koppens, M.L.; Gras, S. L.; Ducker, W.A.. *Langmuir* **2010**, 26, 1013-1018
85. The formation of hydrophobic films on silica with alcohols, Dion, M.; Rapp, M.; Rorrer, N.; Shin, D.-H.; Martin, S. M.; Ducker, W. A. *Colloids and Surfaces A*, **2010**, 362, 65-70.
84. Shear flow promotes amyloid-beta fibrilization Dunstan DE, Hamilton-Brown P, Asimakis P.; Ducker, W *Protein engineering design & selection*, **2009**, 22, 741-746.
- 83 Pectins influence microfibril aggregation in celery cell walls: An atomic force microscopy study Thimm, J. C. ,Burritt, D. J., Ducker, W.A., Melton, L.D. *Journal of Structural Biology*, **2009**, 168, 337-344.
- 82 Shear-induced structure and mechanics of beta-lactoglobulin amyloid fibrils, Dunstan, D.E.; Hamilton-Brown, P.; Asimakis, P.; Ducker, W.; and Bertolini, J., *Soft Matter* **2009**, 5, 5020-5028.
- 81 Contact Angle and Stability of Interfacial Nanobubbles Ducker, W. A. *Langmuir*, **2009**, 25 8907-8910.
- 80 Nanoscale Patterning of Ionic Self-Assembled Multilayers, Tulpar, A.; Wang, Z.; Jang, C.-H.; Jain, V.; Heflin, J.R.; Ducker, W. A. *Nanotechnology*, **2009**, 20, 155301-155305.
- 79 Simple Method for Controlled Association of Colloidal-Particle Mixtures using pH-Dependent Hydrogen Bonding, Starck, P.; Ducker, W. A., *Langmuir*, **2009**, 25, 2114–2120.
- 78 Peptides Grafted from Solids for the Control of Interfacial Properties, Mosse, W. K. J.; Koppens, M.L.; Gengenbach, T. R.; Scanlon, D. B.; Gras, S. L.; Ducker, W.A.. *Langmuir*, **2009**, 25, 1488–1494.
77. How Does Shear Affect A β Fibrillogenesis? Hamilton-Brown, P.; Bekard, I.; Ducker, W. A. Dunstan, D. E. *Journal of Physical Chemistry. B*, **2008**, 112, 16249–16252.
- 76 Squeeze Film Lubrication in Silicone Oil: Experimental Test of the No-Slip Boundary Condition at Solid-Liquid Interfaces, Honig, C. D. F.; Ducker, W. A., *Journal of Physical Chemistry C*, **2008**, 112, 17324-17330.
75. Approximate prediction of adhesion between two solids immersed in surfactant solution based on adsorption to an isolated solid, Lokar, W. J.; Ducker, W. A., *Colloid and Surfaces A*. **2008**, 322, 256-260.
74. Nanobubbles at the interface between water and a hydrophobic solid, Zhang, X. H.; Quinn, A.; Ducker, W. A., *Langmuir*, **2008**, 24, 4756-4764. <https://doi-org.ezproxy.lib.vt.edu/10.1021/la703475q>
73. Influence of atomic force microscope cantilever tilt and induced torque on force measurements, Edwards, S. A.; Ducker, W. A.; Sader, J. E., *Journal of Applied Physics*, **2008**, 103, 064513.
72. Thin film lubrication for large colloidal particles: Experimental test of the no-slip boundary condition, Honig, C. D. F.; Ducker, W. A., *Journal of Physical Chemistry C*, **2007**, 111, 16300-16312.
- 71 Interfacial Oil Droplets, Zhang, X. H.; Ducker, W. A. *Langmuir*, **2007**, 24, 110-115.
70. Formation of Interfacial Nanodroplets through Changes in Solvent Quality, Zhang, X. H.; Ducker, W. A. *Langmuir*, **2007** 23, 12478–12480.
69. Surface chemistry and rheology of polysulfobetaine-coated silica, Starck, P.; Mosse, W. K. J.; Nicholas, N. J.; Spiniello, M.; Tyrrell, J.; Nelson, A.; Qiao, G. G.; Ducker, W. A., *Langmuir*, **2007**, 23, 7587-7593.

68. A Nanoscale Gas State, Zhang, X. H., Khan, A., **Ducker, W.A.** *Physical Review Letters*, **2007**, *98*, 136101.
67. No slip hydrodynamic boundary condition for hydrophilic particles, Honig, C. D. F.; Ducker, W. A. *Physical Review Letters*, **2007**, *98*, 028305. <https://journals-aps-org.ezproxy.lib.vt.edu/prl/abstract/10.1103/PhysRevLett.98.028305>
66. Flip-flop in adsorbed bilayers, Khan A, Ducker WA, Mao M, *Journal of Physical Chemistry B* **2006**, *110*, 23365-23372. Times cited: 0
65. Measurement of the absolute separation for atomic force microscopy measurements in the presence of adsorbed polymer, McKee, C.T. *, Mosse, W.K.J. *, Ducker, W.A. †, *Review of Scientific Instruments*, **2006**, *77*, Art. No. 053706.
64. An atomic force microscope tip as a light source, Lulevich, V., Honig, C. *, Ducker, W.A. †, *Review of Scientific Instruments*, **2005**, *76*, Art. No. 123704.
63. Refractive index of thin, aqueous films between hydrophobic surfaces studied using evanescent wave atomic force microscopy, McKee, C.T. *, Ducker, W.A., *Langmuir*, **2005**, *21*, 12153-12159.
62. Modeling of confinement-induced phase transitions for surfactant layers on amphiphilic surfaces, Leermakers, F.A.M., Koopal, L.K., Lokar, W.J., Ducker, W.A., *Langmuir*, **2005**, *21*, 11534-11545. <https://pubs.acs.org/doi/abs/10.1021/la051569m>
61. Scanning near-field optical microscopy utilizing silicon nitride probe photoluminescence, Lulevich, V., Ducker, W.A., *Applied Physics Letters*, **2005**, *87*, Art. No. 214107.
60. Confinement-induced phase transition and hysteresis in colloidal forces for surfactant layers on hydrophobic surfaces, Koopal, L.K., Leermakers, F.A.M., Lokar, W.J., Ducker, W.A., *Langmuir*, **2005**, *21*, 10089-10095.
59. Cloning strategy for producing brush-forming protein-based polymers, Henderson, D.B., Davis, R.M., Ducker, W.A., Van Cott, K.E., *Biomacromolecules*, **2005**, *6*, 1912-1920.
58. Relationship between scattered intensity and separation for particles in an evanescent field, McKee, C.T., Clark, S.C., Walz, J.Y., Ducker, W.A., *Langmuir*, **2005**, *21*, 5783-5789.
57. Effect of Degassing and Ionic Strength on AFM Force Measurements in Octadecyltrimethylammonium Chloride Solutions, Zhang, J., Yoon, R-H., Ducker, W.A., *Langmuir*, **2005**, *21*, 5831-5841.
56. Unnatural Proteins for the Control of Surface Forces, Tulpar, A., Henderson, D.B., Mao, M., Caba, B., Davis, R.M., Van Cott, K.E., Ducker, W.A., *Langmuir* **2005**, *21*, 1497-1506.
55. Confinement-induced phase behavior and adsorption regulation of ionic surfactants in the aqueous film between charged solids, Lokar, WJ, Koopal, LK, Leermakers, F.A.M, Ducker, W.A., *Journal of Physical Chemistry B* **2004**, *108*, 15033-15042. <https://pubs.acs.org/doi/abs/10.1021/jp0479668>
54. Atomic force microscopy colloid-probe measurements with explicit measurement of particle-solid separation, Clark, S.C, Walz, J.Y, Ducker, W.A., *Langmuir* **2004**, *20*, 7616-7622.
53. Forces between glass surfaces in mixed cationic-zwitterionic surfactant systems, Lokar, W.J, Ducker, W.A., *Langmuir* **2004**, *20* (11): 4553-4558. <https://pubs.acs.org/doi/abs/10.1021/la036459z>

52. Self-consistent field analysis of ionic surfactant adsorption regulation in the aqueous film between two neutral solids, Lokar, W.J., Koopal, L.K., Leermakers, F.A.M., Ducker, W.A., *Journal of Physical Chemistry B* **2004**, *108*, 3633-3643.
51. Is there a thin film of air at the interface between water and smooth hydrophobic solids? Mao, M., Zhang, J., Yoon, R., Ducker, W.A., *Langmuir* **2004**, *20*, 1843-1849.
50. Surfactant Adsorption at Solid-Aqueous Interfaces Containing Fixed Charges; Experiments revealing the role of Surface Charge Density and Surface Charge Regulation. Tulpar, A.; Ducker, W.A., *Journal of Physical Chemistry B*. **2004**, *108* 1667-1676.
49. Proximal Adsorption at Glass Surfaces: Ionic Strength, pH, Chain length Effects, Lokar, W. J. Ducker, W. A. **2004**, *20*, 378-388. <https://pubs.acs.org/doi/abs/10.1021/la035288v>
48. Surfactant self-assembly at the barite-solution interface, Bokern, D. G., Ducker, W.A., Hunter, K. A. McGrath, K. M. *Colloid Surface A* **2003**, *229*, 43-53.
47. Exchange Rates and Kinetics of Desorption of Surfactant at the Solid-Liquid Interface Clark, S. P.; Ducker, W. A. *J. Phys. Chem. B*. **2003** *107* 9011-9021.
46. Forces between Colloid Particles in Natural Waters, Mosely, L. M., Hunter, K. H., Ducker, W. A. *Journal of Environmental Science and Technology* **2003**, *37*, 3303-3308.
45. A strategy for the Sequential Patterning of Proteins; Catalytically Active Multi-protein Nanofabrication Jang, C.-H.*; Calter, M. A. †; Ducker, W. A. † *Nanoletters* **2003**, *3*, 691-693.
44. Surface Imaging Of A Natural Mineral Surface Using Scanning-Probe Microscopy, Bokern D. G. *; Ducker, W. A.; Hunter, K. A. ‡; McGrath, K. M. †† *Journal of Crystal Growth* **2002**, *246*, 139-149.
43. Immobilized Enzymes as Catalytically-Active Tools for Nanofabrication, Jang, C.-J*; Stevens, B. D. †; Carlier, P. R. ‡; Calter, M. A. ‡; Ducker, W. A. † *Journal of the American Chemical Society* **2002**, *124*, 12114-12115.
42. Celery (*Apium Graveolens*) Parenchyma Cell Walls: Cell Walls with Minimal Xyloglucan, Thimm, J. C. *; Burritt, D. J. ‡; Sims, I. M.; Newman, R. H.; Ducker, W. A.; Melton, L. D. †† *Physiologia Plantarum* **2002**, *116*, 164-171.
41. Proximal adsorption of dodecyltrimethylammonium bromide to the silica-electrolyte solution interface Lokar, W. J.*; Ducker, W. A. † *Langmuir* **2002**, *18* 3167-3175.
40. AFM Study of Adsorption of Cationic Surfactants and Cationic Polyelectrolytes at the Silica-Water Interface, Liu§, J.-F. ,Min*, G.; Ducker†, W. A. *Langmuir* **2001**, *17* 4895-4903.
39. Decay Lengths of Double-layer Forces in Solutions of Partly Associated Ions, Tulpar*, A.; Subramanian§, V.; Ducker†, W. *Langmuir* **2001**, *17* 8451-8454.
38. Proximal Adsorption of Cationic Surfactant on Silica at Equilibrium, Subramanian§, V; Ducker†, W. A *Journal of Physical Chemistry B* **2001**, *B* 105, 1389-1402.
37. Some Fundamental Differences in the Adhesion and Friction of Rough versus Smooth Surfaces Israelachvili†, J.; Giasson‡, S.; Kuhl, T.; Drummond, C.; Berman, A.; Luengo, J.; Pan, M.; Heuberger, M.; Ducker, W.; Alcantar, N. *Tribological Series* **2000**, *38*, 3-12.

36. Celery (*Apium Graveolins* L.) Parenchyma Cell Walls Examined by Atomic Force Microscopy: Effect of Dehydration on Cellulose Microfibrils, Thimm*, J. C.; Burritt^{‡†}, D. J.; Ducker, W. A.; Melton[‡], L. D. *Planta* **2000**, *212*, 25–32.
35. Aggregation of ω -hydroxy Quaternary Ammonium Bolaform Surfactants, Davey*, T. W.; Ducker[†], W. A.; Hayman[‡] A. R. *Langmuir* **2000**, *16*, 2430–2435.
34. Counterion Effects on Adsorbed Micellar Shape: Experimental Study of the Role of Polarizability and Charge, Subramanian[§], V.; Ducker[†], W. A. *Langmuir* **2000**, *16*, 4447–4454.
33. Self-Assembled Supramolecular Structures of Charged Polymers at the Graphite/Liquid Interface, Liu[§], J.-F., Ducker[†], W. A. *Langmuir* **2000**, *16*, 3467–3473.
32. Surface-Induced Phase Behavior of Alkyltrimethylammonium Bromide Surfactants Adsorbed to Mica, Silica, and Graphite, Liu[§], J.-F.; Ducker[†], W. A. *Journal of Physical Chemistry B* **1999**, *103*, 8558–8567.
31. Adsorption of Hexadecyltrimethylammonium Bromide to Mica: Nanometer-Scale Study of Binding-Site Competition, Ducker[†]; W. A.; Wanless[§], E. J. *Langmuir* **1999**, *15*, 160–168.
30. Surface-Induced Transformations for Surfactant Aggregates, Lamont*, R. E.; Ducker[†], W. A., *Journal of the American Chemical Society* **1998**, *120*, 7062–7067.
29. Krafft Temperature Depression in Quaternary Ammonium Bromide Surfactants, Davey*, T. W.; Ducker, W. A.; Hayman[‡], A. R.; Simpson[‡], J., *Langmuir* **1998**, *14*, 3210–3213.
28. Nanometer-Scale Organization of Ethylene Oxide Surfactants on Graphite, Hydrophobic Silica, and Hydrophobic Silica, Grant*, L. M.; Tiberg[‡], F.; Ducker[†], W. A. *Journal of Physical Chemistry B* **1998**, *102*, 4288–4294.
27. Surface-Aggregate Phase Transition, Wanless[§], E. J.; Davey*, T. W.; Ducker[†], W. A., *Langmuir* **1997**, *16*, 4223–4228.
26. Effect of Substrate Hydrophobicity on Surface-Aggregate Geometry: Zwitterionic and Non-ionic Surfactants, Grant*, L. M.; Ducker[†], W. A., *Journal of Physical Chemistry B* **1997**, *101*, 5337–5345.
25. Organized Structure of Lithium Perfluorooctanesulfonate at the Graphite-Solution Interface, Lamont*, R. E.; Ducker[†], W. A., *Journal of Colloid Interface Science* **1997**, *191*, 303–311.
24. Weak Influence of Divalent Ions on Anionic Surfactant Surface Aggregation, Wanless[§], E. J.; Ducker[†], W. A., *Langmuir* **1997**, *13*, 1463–1474.
23. Effect of Zwitterionic Surfactants on Interparticle Forces, Rheology and Particle Packing of Silicon Nitride Slurries, Ducker, W. A.; Luther, E. P.; Clarke, D. R. [†]; Lange, F. F., *Journal of the American Ceramics Society* **1997**, *80*, 575–583.
22. Surface-Aggregate Shape Transformation, Wanless[§], E. J.; Ducker[†], W. A., *Langmuir* **1996**, *12*, 5915–5920.
21. Effect of Substrate Hydrophobicity on Surfactant Surface-Aggregate Geometry, Ducker[†], W. A.; Grant*, L. M., *Journal of Physical Chemistry B* **1996**, *100*, 11507–11510.
20. Organization of Sodium Dodecylsulfate at the Graphite-Solution Interface, Wanless[§], E. J.; Ducker, W. A. [†], *Journal of Physical Chemistry B* **1996**, *100*, 3207–3214. <https://doi-org.ezproxy.lib.vt.edu/10.1021/jp952439x>

19. Adsorption of Dipolar (Zwitterionic) Surfactants to Dipolar Surfaces, Chavez, P.; Ducker, W. A.; Israelachvili[†], J. N.; Maxwell, K., *Langmuir* **1996**, *12*, 4111–4115.
18. Forces between Crystalline Alumina (Sapphire) Surfaces in Aqueous Dodecylsulfate Surfactant Solutions, Xu, Z.; Ducker, W. A.; Israelachvili[†] J. N., *Langmuir* **1996**, *12*, 2263–2270.
17. Measuring Surface Forces in Aqueous Electrolyte Solution with the Atomic Force Microscope, Butt^{†‡}, H.-J.; Jaschke, M.; Ducker, W. A.; *Bioelectronics and Bioenergetics* **1995**, *38*, 191–201.
16. Origin and Characterization of Different Stick-Slip Mechanisms, Berman, A. D.; Ducker, W. A.; Israelachvili[†], J. N., *Langmuir* **1996**, *12*, 4559–4563.
15. Measurement of Hydrophobic and DLVO Forces in Bubble-Surface Interactions in Aqueous Solutions, Ducker[†], W. A.; Xu, Z.; Israelachvili, J. N., *Langmuir* **1994**, *10*, 3270–3289.
14. The Forces between Alumina Surfaces in Salt Solutions: Non-DLVO Forces and their Effect on Colloidal Processing. Ducker[†], W. A.; Xu, Z.; Israelachvili, J. N., Clarke, D. R., *Journal of the American Ceramics Society* **1994**, *77*, 437–443.
13. Experimental Determination of Spring Constants in Atomic Force Microscopy, Senden, T. J.; Ducker[†], W. A., *Langmuir* **1994**, *10*, 1003–1005.
12. Controlled Modification of Silicon Nitride Interactions in Water via Zwitterion Surfactant Adsorption, Ducker[†], W. A.; Clarke, D. R., *Colloids and Surfaces A* **1994**, *94*, 275–292.
11. Lateral, Normal and Longitudinal Spring Constants of Atomic Force Microscopy Cantilevers, Neumeister[†], J. N.; Ducker, W. A., *Review of Scientific Instruments* **1994**, *65*, 2527–2531.
10. Van der Waals Epitaxial Growth of α -Alumina Nanocrystals on Mica, Steinberg, S.; Ducker, W. A.; Vigil, G.; Hyukjin, C.; Frank, C.; Tseng, W.; Clarke, D. R.; Israelachvili[†], J. N., *Science* **1993**, *260*, 656–659.
9. Measurement of Forces in Liquids Using a Force Microscope, Ducker[†], W. A.; Senden, T. J.; Pashley, R. M., *Langmuir* **1992**, *8*, 1831–1836.
8. Forces between Mica Surfaces in the Presence of Rod-Shaped Divalent Counter-ions, Ducker[†], W. A.; Pashley, R. M., *Langmuir* **1992**, *8*, 109–112.
7. The Surface Roughness of Plasma Treated Mica, Senden, T. J.; Ducker[†], W. A., *Langmuir* **1992**, *8*, 733–734.
6. Direct Measurement of the Forces on a Colloid Particle using an Atomic Force Microscope, Ducker[†], W. A.; Senden, T. J.; Pashley, R. M., *Nature* **1991**, *353*, 239–241.
5. Rapid Measurement of Static and Dynamic Surface Forces, Ducker[†], W. A.; Cook, R. F., *Applied Physics Letters* **1990**, *56*, 2408–2410.
4. Force Measurement using an AC Atomic Force Microscope, Ducker[†], W. A.; Cook, R. F.; Clarke, D. R., *Journal of Applied Physics* **1990**, *67*, 4045–4052.
3. Multilayer Adsorption of Cytochrome C on Mica around the Isoelectric pH, Kekicheff[†], K., Ducker, W. A.; Ninham, B. W.; Pelini, M.-P., *Langmuir* **1990**, *6*, 1704–1708.
2. The Forces between Mica Surfaces in Ammonium Chloride Solutions, Ducker, W. A. [†]; Pashley, R. M., *Journal of Colloid and Interface Science* **1989**, *131*, 433–436.

1. The Flotation of Quartz using a Double-Chained Cationic Surfactant, Ducker, W. A.; Pashley[†], R. M.; Ninham, B. W., *Journal of Colloid and Interface Science*. **1989**, *128*, 66–75.

Book Chapter

1. Atomic Force Microscopy of Adsorbed Surfactant Micelles, Ducker, W. A. in *Surfactants in Solution: Fundamentals and Applications*, Ed: Mittal and Shah, Marcel Dekker: New York, 2003.

Papers in Refereed Proceedings

1. Experimental and Theoretical Investigations of Stick-Slip Friction Mechanisms, Berman, A. B.; Ducker, W. A.; Israelachvili[†], J. N. in *The Physics of Sliding Friction*, NATO Advanced Science Institute Series, 1995.
2. Effect Of Dissolved Gas On The Force Between Silica And Glass In Aqueous Octadecyltrimethylammonium Chloride Solutions. Jinhong Zhang, Roe-Hoan Yoon, Min Mao, William A. Ducker Centenary of Flotation Conference, Brisbane 2005
3. Adsorbed Nanofluids William A Ducker and Xuehua Zhang 8th World Congress of Chemical Engineering, Montreal, 2009

Technical Report

1. Probing Nano-Scale Forces with the Atomic Force Microscope
Ducker, W. A., Digital Instruments Applications Note, 1995.

Patent

1. US Patent No 5,925,818 and 5,670,712 Jason Cleveland, William Ducker, Craig Prater, Paul Hansma, "Method and Apparatus for Magnetic Force Control of a Scanning Probe."
2. US Patent No 7,234,343 "Method And Apparatus for Evanescent Field Measuring of Particle-Solid Separation" (Submitted)

Invited Lectures at International Conferences

1. *Lubrication Forces and the Flow of Air Over Solid Surfaces*, 3rd International Mini-Symposium on Surface Forces January 25, 2016, Sendai Japan, William Ducker and Dong-Jin Seo
2. *Germany Lubrication Forces and the Flow of Air over Solid Surfaces: Can They Be Manipulated via the Flow Boundary Condition?* ACIS 2015 (International Association of Colloid and Interface Science triennial conference), May 24–29 2015, Mainz, William Ducker and Dong-Jin Seo (Keynote Lecture).
3. *Preventing Bacterial Colonization Using Colloidal Crystals*, Surface Forces Apparatus Conference 2014 August 24-29 Cancun, Mexico, Ducker, W. A.; Kargar, M.; and Pruden, A.
4. *Forces Between Hydrophobic Solids*, Ducker W.A. and Mastropietro, D. Telluride Conference on Hydrophobicity, June 24-28, 2014
5. *Nanobubbles and Micropancakes*, Les Houches, February 12th-17th, 2012 (EUROMECH Colloquium 536). *Forces at Hydrophobic Surfaces*
6. *Forces at Hydrophobic Surfaces*, Gordon Conference on Water, Ducker, W. and Mastropietro, D. August 12-17, 2012, Holderness School, Holderness, NH.
7. *Interfacial Nanobubbles*, Nanobubbles Conference, Abbingdon, U. K. May, 11-13. 2011
8. *Lubrication forces between a solid plate and a particle in air and liquids*, 84th ACS Colloid and Surface Science Symposium, Akron, Ohio, June 20-23, 2010.
9. *Evanescent Wave AFM measurements*, 13th International Conference on Surface and Colloid Science/ 83rd ACS Colloid and Surface Science Symposium, Columbia University, New York, June 14-19, 2009.
10. *Lubrication Forces in Squeeze Films*, Interfaces Against Pollution, Kyoto, Japan June 4, 2008.
11. *Hydrodynamics in Small Spaces*, Australia-Japan, Core to Core Conference, Japan, June 6, 2008.
12. *Spectroscopic Evidence for the Existence of Interfacial Nanobubbles and Nanofluids*, Core to Core Meeting, Kyoto, Japan June 5, 2008.
13. *Interfacial Nanobubbles and Fluids*, 2008 International Conference on Nanoscience and Nanotechnology, 25-29 February 2008, Victoria, Australia.
14. *Interfacial Nanofluids*, Conference on the Physics, Chemistry and Biology of Water, October 18-21 2007, West Dover, Vermont, USA.
15. *Forces Acting on Small Particles, The role of Hydrodynamics and Interfacial Structure*, International Mini-Symposium on Surface Forces Matsushima, Japan 5-6 March, 2007.
16. *Evanescent Wave Atomic Force Microscopy*, International Conference on Nanoscience and Nanotechnology, Brisbane Convention Centre, Brisbane Queensland, July 3-10, 2006.
17. *Shedding light on the dark side of surfaces forces*. Bridging Nanoscale Forces and Interfacial Phenomena to the Macroscopic World (SFAC), International Workshop, Cancun, Mexico, May 7-12, 2006.
18. *Patterning of Surfaces on the Nanometer-Scale: Film formation with Proteins and Surfactants*, Scaling Down to a Nanomaterials World, University of Melbourne, Australia, December 1-4, 2003.

19. *Proximal Adsorption: Changes in Adsorption during the Interaction between Colloidal Particles, Particles and Polymers Near Interfaces: Fundamentals and Applications*, Oud Poelgeest, Netherlands, March 23-26, 2002.
20. *Proximal Adsorption at Interfaces*, Organic Thin Films Gordon Conference, Salve Regina, Newport RI June 24 - 29, 2001.
21. *AFM studies of Surfactants at Interfaces*, Gordon Research Conference on the Science of Adhesion, Tilton School, Tilton, NH, USA, August 6–11, 2000.
22. *Dynamic Surfactant Adsorption as the determinant of Surface Forces and Colloidal Stability*, 10th International Conference on Colloid and Interface Science, Bristol, U.K. July 23–28, 2000.
23. *Aggregation of Surfactants at Interfaces*, 13th International Symposium on Surfactants in Solution, Gainesville, FL, USA. June 11–16, 2000.
24. *Surfactant Adsorption: Effects of Intermolecular Forces on Adsorbate Structures*, Advances in Force Microscopy and Spectroscopy with Bioprobes, Linz, Austria, January 31–February 5, 1999.
25. *The Organization of Surfactants at Interfaces*, New Concepts in Soft Condensed Matter, Lampang, Thailand, January 26–30, 1998.
26. *Surface Adsorption at the Solid-Liquid Interface Studied by AFM*, Plenary Lecture, Scanning Probe Microscopy, July 7-9, 1996, Newcastle, Australia,
27. *Controlled Modification of Particulate Rheology by Surface Adsorption*, European Science Foundation: “Reactivity in Organized Microstructures: New Materials”, July 6-11, 1994, Ottrott Le Haut, France.
28. *Design and Testing of Particulate Interactions Through Atomic Force Microscopy Measurements*, Engineering Foundation Conference, January 9-14, 1994, Kona, HI, US,
29. *Interactions between Metal Oxide Surfaces in Water*, Gordon Research Conference: “Water and Aqueous Solutions”, August 3-7, 1992 Plymouth, NH, USA.
30. *Surface Force Measurements on Colloidal Particles using an Atomic Force Microscope*, Gordon Research Conference: “Chemistry at Interfaces”, July 13-17, 1992 Meriden, NH, USA.

Other Oral Conference Presentations

Do interfacial “nanobubbles” contain gas? Dong-Jin Seo and William Ducker, 89th ACS Colloid and Surface Chemistry Conference, Carnegie Mellon University, June 15-17, 2015.

Polymer Microspheres to Direct the Assembly of Bacterial Cells and Prevent Biofilm Formation, William A. Ducker, Mehdi Kargar, Yow-Ren Chan and Amy Pruden. Macromolecular Institute Symposium, April 22, 2015.

Colloidal Crystals used to Direct the Assembly of Bacterial Cells, William Ducker, Mehdi Kargar, Yow-Ren Chan and Amy Pruden, 89th ACS Colloid and Surface Chemistry Conference, Carnegie Mellon University, June 15-17, 2015.

Thermal Transport through Monolayers at Solid-Liquid Interfaces, 245th ACS National Meeting & Exposition New Orleans, April 7-11, 2013.

Single Molecule Measurements Using Correlation Force Spectroscopy. Radiom M.; Robbins B.; Paul M.; Ducker W. APS March Meeting, Baltimore, Maryland, March 18–22, 2013

Correlation Force Microscopy, Radiom M., Robbins B., Seo D., Walz J., Paul M., and Ducker W. 87th American Chemical Society Colloid & Surface Science Symposium, UC Riverside, CA, June 23-26, 2013.

The effect of gas type and humidity levels on the collisions of gas molecules with solids and liquids, Seo, D. and Ducker, W. A., 87th American Chemical Society Colloids and Surfaces Symposium, UC Riverside, CA, June 23-26, 2013.

Forces between Hydrophobic Solids in Water, Ducker, W. A. and Mastropietro, D. 247th ACS National Meeting, Dallas, TX, March 16-20, 2014.

In situ control of Gas flow by modifying thin film on solid surfaces, Seo, D. and Ducker, W. A., *Forces between Hydrophobic Surfaces*, Ducker, W. A. and Mastropietro, D. Correlation Force Spectroscopy, Radiom M., Robbins B., Seo D., Walz J., Paul M., Ducker, W. A. 1st Colloid + Surface Symposium at Virginia Tech, April 2014.

Effect of humidity and surface chemistry on particle impingement on a Solid, Ducker, W. A. and Seo, D., 246th ACS National Meeting, Indianapolis, Indiana, September 8-12, 2013.

Change in lubrication force and accommodation coefficient on thin films modified by external stimuli, Seo, D. and Ducker, W. A., 66th American Physical Society Division of Fluid Dynamics Meeting, November 2013.

Thermal Transport through Monolayers at Solid-Liquid Interfaces, Ducker, W. Harikrishna, Huxtable, S. T. 245th ACS National Meeting & Exposition April 7-11, 2013. New Orleans

The Correlated Dynamics of Tethered Microcantilevers in a Viscous Fluid. Robbins, M. Radiom, J. Walz, W. Ducker, and M.R. Paul, American Physical Society 65th Annual Division of Fluid Dynamics Meeting, San Diego CA, November 18-20, 2012.

Fluid Properties Probed by Analysis of the Correlations between the Fluctuations in Deflection of Two Cantilevers, Milad Radiom, Brian Robbins, John Walz, Mark Paul, William Ducker, 86th Colloid and Surface Science Symposium, Baltimore, June 10-13, 2012.

Correlated Dynamics of Tethered Microcantilevers in a Viscous Fluid. Robbins, B.; Radiom, M.; Walz, J. Y.; Ducker, W.; Paul, M. R. American Physical Society 65th Annual Division of Fluid Dynamics Meeting, San Diego CA, November 18-20, 2012.

Correlation Force Spectroscopy for Single Molecule Measurements. Radiom, M.; Robbins, B.; Walz, J. Y.; Paul, M. R.; Ducker, W.; American Physical Society 65th Annual Division of Fluid Dynamics Meeting, San Diego CA, November 18-20, 2012.

Forces Between Hydrophobic Solids in Aqueous Salt Solution, Ducker, W. A.; Mastropietro, D. 244th ACS National Meeting, Philadelphia, August 19 – August 23, 2012.

Force spectroscopy of single molecules using correlated fluctuations of cantilevers. Radiom M.; Robbins B.; Walz J.; Paul M.; Ducker W. IUPAC MACRO2012 World Polymer Congress, Virginia Tech, June 24-29, 2012

Fluid Properties Probed by Analysis of the Correlations between the Fluctuations in Deflection of Two Cantilevers, Milad Radiom, Brian Robbins, John Walz, Mark Paul, William Ducker, 86th Colloid and Surface Science Symposium, Baltimore, June 10-13, 2012.

Forces between hydrophobic solids in concentrated aqueous salt solution Dean Mastropietro and William Ducker 86th Colloid and Surface Science Symposium, Baltimore, June 10-13, 2012.

Grafted peptides and their effects on frictional properties at interfaces, Dmitri Iarakov and William Ducker 86th Colloid and Surface Science Symposium, Baltimore, June 10-13, 2012.

Fluid Properties Probed by Analysis of the Correlations between the Fluctuations in Deflection of Two Cantilevers, Milad Radiom, Brian Robbins, John Walz, Mark Paul, William Ducker, 86th Colloid and Surface Science Symposium, Baltimore, June 10-13, 2012.

FTIR Study of the Specific Adsorption of Growth Directing Molecules on ZnO Surfaces, International Association of Colloid and Interface Scientists, Conference, Sendai, Japan, 13-18 May, 2012 N. J. Nicholas, G. V. Franks and W. Ducker,

Correlation Force Spectroscopy,
243rd American Chemical Society National Meeting March 25-29, 2012
Radiom, M.; Robbins, B.; Walz, J. Y.; Paul, M. R.; Ducker, W.,

Forces between Hydrophobic Surfaces,
243rd American Chemical Society National Meeting March 25-29, 2012
Ducker, W. and Mastropietro, D.

Molecule and Fluid Properties Probed by Analysis of the Correlations between the Fluctuations in Deflection of Two Cantilevers,
243rd ACS National Meeting, San Diego, CA, March 25-29, 2012,
William A. Ducker, Christopher D. F. Honig, Milad Radiom, Brian Robbins, John Y. Walz, and Mark R. Paul.

Gas Flow near a Smooth Plate, William Ducker and Adam Bowles, American Physical Society 64th Annual Division of Fluid Mechanics, November 20–22, 2011; Baltimore, MD.

Correlated Fluctuations Of Atomic Force Microscope Cantilevers In Viscous Medium, Milad Radiom, Brian Robbins, John Walz, Mark Paul, William Ducker, American Physical Society 64th Annual Division of Fluid Mechanics, November 20–22, 2011; Baltimore, MD.

Hindered rotation of water near C₆₀
241st American Chemical Society National Meeting, Anaheim, California, March 27-31, 2010

The Mechanism of Hydrothermal ZnO Growth
241st American Chemical Society National Meeting, Anaheim, California, March 27-31, 2010

Nanobubbles: what are they and why are they stable?
AND

Peptides grafted from solids for the control of interfacial properties
13th International Conference on Surface and Colloid Science/ 83rd ACS Colloid and Surface Science
Symposium, Columbia University, New York, June 14-19

Adsorbed Nanofluids
8th World Congress on Chemical Engineering
Montreal, Canada, August 21-26 2009

Lubrication forces in air measured by oscillatory modes using an atomic force microscope
Fall Fluid Mechanics Symposium
The Inn at Virginia Tech November 10, 2009

Lubrication Forces on Colloidal Particles
Chris Honig and William Ducker
AND
New Method for the Preparation of Peptide Films on Solids
Wade Mosse and William Ducker
Australian Colloid and Interface Science Symposium
Feb 1-5, 2009
Adelaide, Australia

Accurate Measurement of the Solid-Liquid Boundary Condition for Fluid Flow
William Ducker and Chris Honig
Fall Fluid Mechanics Symposium
The Inn at Virginia Tech November 13, 2008

Direct Synthesis of Peptides on Silica
Wade Mosse, Merran Koppens, Thomas Gengenbach, Denis Scanlon, Sally Gras, William Ducker
UK Polymer Colloids Forum
Bristol, UK August 28–29, 2008

Nanobubbles at Interfaces
William Ducker, Xuehua Zhang
The Physics, Chemistry and Biology of Water
Mount Snow Resort,
West Dover, Vermont
October 22–25, 2007

The Goliath of Surface Forces
Chris Honig and William Ducker
Australian Student's Conference
Warnambool, Australia
Feb 3–6, 2008

Lubrication Forces in Squeeze Films
William Ducker and Chris Honig
Interfaces Against Pollution
Kyoto, Japan June 4, 2008

Spectroscopic Evidence for the Existence of Interfacial Nanobubbles and Nanofluids
William Ducker and Xuehua Zhang
Core to Core Meeting
Kyoto, Japan June 5, 2008

Accurate Measurement of the Solid-Liquid Boundary Condition for Fluid Flow

William Ducker and Chris Honig
Fall Fluid Mechanics Symposium
The Inn at Virginia Tech November 13, 2008

The no-Slip Boundary Condition
Wade Mosse, Merran Koppens, Thomas Gengenbach, Denis Scanlon, Sally Gras, William Ducker
UK Polymer Colloids Forum
Bristol, UK August 28–29, 2009

Evanescent Wave AFM
MRS San Francisco, 2008

Forces Acting on Small Particles, The role of Hydrodynamics and Interfacial Structure. International Mini-Symposium on Surface Forces Matsushima, Japan 5-6 March, 2007

A Nanoscale Gas State.
X. Zhang, W.A. Ducker, A Khan
ACIS 2007, Sydney February 4-8, 2007

The Influence of Zwitterionic Polymer on the Stability of Colloidal Dispersions and Surface Properties
P Stark, W. Ducker
ACIS 2007, Sydney February 4-8, 2007

Hydrodynamic Forces in Aqueous Solution
W.A. Ducker, C. Honig
IACIS, Beijing, China, October 16-20, 2006.

A Nanoscale Gas State.
X. Zhang, W.A. Ducker,
IACIS, Beijing, China, October 16-20, 2006.

Hydrodynamic Forces in Aqueous Solution
W.A. Ducker, C. Honig
XIIIth International Conference, Surface Forces, Moscow, Russia, June 28 – July 4, 2006.

Kinetics of Amphiphile Exchange in Adsorbed Lamellar Layers
W.A. Ducker, A. Khan, S. Clark, M. Mao,
80th ACS Colloid & Surface Science Symposium, Boulder, Colorado, June 18 – 21, 2006

Effect of Dissolved Gas on the Force Between Silica and Glass in Aqueous Octadecyltrimethylammonium Chloride Solutions
J. Zhang, R-H Yoon, M. Mao, W.A. Ducker
Centenary of Flotation Symposium, Brisbane, Australia 6 -9 June 2005

Nanotechnology at the University of Melbourne
W.A. Ducker
Australian – United Kingdom Bionanotechnology Mission, UK, 23-29 April, 2005.

Attractive Forces between Silica and Glass Solids in Aqueous C₁₈TACl Surfactant Solutions:
Hydrophobic Forces, Bubbles and Effects of Inhomogeneous Surfaces
J. Zhang, M. Mao, R-H. Yoon, W.A. Ducker
78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004.

Unnatural proteins for the control of surface forces
Tulpar, A., Henderson, D., Davis, R.M., Van Cott, K.E., Ducker, W.A.
Australian Colloid & Interface Symposium, Coogee Beach, Sydney, Australia, 13-17 February 2005.

Artificial Proteins for the Intelligent Control of Colloidal Forces

Tulpar, W. Ward, M. Mao, D. Henderson, R.M. Davis, K.E. Van Cott, W.A. Ducker

78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004

Regulation of Surfactant Adsorption in Mixed Systems of Cationic and Zwitterionic Surfactants

W.J. Lokar, W.A. Ducker

78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004

Evanescent Wave Atomic Force Microscopy: Light Scattering from Hydrophilic and Hydrophobic Particles

McKee, S. Clark, W. Ducker

78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004

AFM Colloid-Probe Measurements with Explicit Measurement of Particle-Solid Separation

W.A. Ducker, J.Y. Walz, S.C. Clark

78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004

Theoretical Calculation of Adsorption Between Two Interacting Solid Surfaces: A Study Using Self-Consistent Field Theory

W.J. Lokar, L.K. Koopal, F.A.M. Leermakers, W.A. Ducker

78th Colloid and Surface Chemistry Symposium, Yale University, Connecticut, June 15-18, 2004

Surfactant Adsorption at The Solid-Aqueous Interface: Experiments Revealing The Role Of Surface Charge Density And Surface Charge Regulation

Aysen Tulpar and William A. Ducker

11th International Conference on Colloid and Surface Science, Iguassu, Brazil, 2003.

Exchange rates of surfactant at the solid-liquid interface obtained by FTIR ATR spectroscopy

Clarke, S. P. Ducker W. A.

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Surfactant adsorption on surfaces with controlled surface charge density

Tulpar A. Ducker, W. A.

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Factors influencing proximal adsorption of surfactants on charge regulating surfaces

Lokar W. J. Ducker, W.A.

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Adsorption of water-soluble triblock copolymers of poly(ethylene oxide) and carboxylic acids on silica and alumina J. Krsmanovic, R. M. Davis, K. E. Van Cott, W. Ducker Riffle, J.

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Adsorption of polyamino acids on silica and alumina from water

J. Krsmanovic, R. M. Davis, K. E. Van Cott, W. Ducker

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Catalytically active multi-protein nanofabrication

C.-H. Jang, W. A. Ducker, M. A. Calter

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Exchange rates of surfactant at the solid-liquid interface obtained by FTIR ATR spectroscopy

S. C. Clark, W. A. Ducker

77th Colloid and Surface Chemistry Symposium, Atlanta, Georgia June 15-18, 2003.

Immobilized Enzymes as Catalytically-Active Tools for Nanofabrication

Jang, C.-J*, Stevens, B. D.†, Carlier, P. R.‡, Calter, M. A. ‡, and Ducker, W. A.†
224th ACS National Meeting, Boston, MA August 18-22, 2002

Enzyme-Assisted Nanolithography Using Atomic Force Microscopy
Jang*, C.-H.; Ducker†, W. A.
75th Annual ACS Colloid and Surface Science Symposium, Pittsburgh, PA, June 10-13, 2001

Proximal Adsorption of Dodecyltrimethylammonium Bromide to the Silica–Electrolyte Solution Interface
Lokar,* W. J. Ducker†, W. A.
75th Annual ACS Colloid and Surface Science Symposium, Pittsburgh, PA, June 10-13, 2001

Influence of Surface Charge on Surfactant Organization at Interfaces
Ducker, W. A.; Tulpar, A.*
75th Annual ACS Colloid and Surface Science Symposium, Pittsburgh, PA, June 10-13, 2001

Surfactants at Interfaces: Adsorption, Structure and Colloidal Stability
Ducker, W.A. ; Subramanian, V. §; Lokar, W.*
ACS National Meeting, San Diego, March 2001.

Second International Symposium on Contact Angle, Wettability and Adhesion
Newark, NJ, USA, June 21–23, 2000
The Influence of Dynamic Adsorption on Adhesion
Subramanian§, V; Ducker, W. A.

74th Colloid and Surfactant Science Symposium
Bethlehem, PA, USA, June 19–21, 2000
Dynamic Surfactant Adsorption as the Determinant of Surface Forces and Colloidal Stability
Ducker, W. A.; Subramanian§, V.

13th International Symposium on Surfactants in Solution
Gainesville, FLA, USA, June 11–16, 2000
Dynamic Surfactant Adsorption as the Determinant of Surface Forces and Colloidal Stability.
Ducker, W. A.; Subramanian§, V.

13th International Symposium on Surfactants in Solution
Gainesville, FLA, USA, June 11–16, 2000
Aggregation of ω -Hydroxy Quaternary Ammonium Bolaform Surfactants.
Ducker, W. A., Hayman, A. R.; Davey*, T. W.

National Science Foundation XYZ Grantees Workshop
Washington, DC, USA, May 24th 2000
Enzyme-Assisted Lithography using Atomic Force Microscopy
Ducker, W. A.

Adhesion Society Meeting - "Adhesion Science for the 21st Century,"
Myrtle Beach, SC, USA, February, 2000
Dynamic Adsorption as a Determinant of Colloidal Stability
Fall*, R.; Subramanian§, V.; Ducker, W. A.

First International Symposium on Self-Assembly of Amphiphilic Systems,
Dresden, Germany, September 13–16, 1998
Surface-induced shape changes for Quaternary Ammonium Surfactants
Ducker, W. A., Wanless§, E. J.; Lamont*, R. E.

72nd ACS Colloid and Surface Science Symposium
Penn. State, PA, USA, June 21–24, 1998

Surface-induced Transformations for Surfactant Aggregates
Ducker, W. A., Wanless[§], E. J.

LB8 Organized Molecular Films
Asilomer, CA, USA, August 24–29, 1997
Shape Transitions in Self-Assembled Surfactant Surface Films Ducker[†], W. A.

Molecules for the Future
Dunedin, New Zealand, December, 2–6 1996
The Organized Structure of Adsorbed Surfactants
Ducker, W. A., Wanless, E. J.; Grant, L. M.; Lamont, R. E.

Partial List of Other Seminar Presentations

1. Forces and Flow at the Microscale, Cytec, August 10, 2012.
2. Dynamic and Static Surface Forces, Department of Applied Mathematics, Australian National University, March 2011.
3. Department of Chemical Engineering, Virginia Commonwealth University, February 2010
4. Department of Chemical Engineering, University of Edmonton, July 2009
5. Department of Chemistry, Virginia Commonwealth University, 2009
6. Department of Chemical Engineering, Monash University, June 2006.
7. Institute of Technology (KTH), Stockholm, Sweden, February 2006.
8. Duke University Department of Mechanical Engineering September 2004
9. Department of Chemical Engineering, Virginia Tech., September, 2001
10. Unilever Research, Edgewater, NJ, April 15, 2001
11. Department of Chemistry, Virginia Tech., Ducker[†], W. A.; Jang*, C.-H., J. P. Wightman Seminar, November 3, 2001.
12. Department of Chemical Engineering, Carnegie–Mellon, PA, October 19, 2000
13. Department of Chemistry, Virginia Tech, September 8, 2000
14. Department of Physics, Virginia Tech, January 20, 2000
15. Department of Chemical Engineering, University of Virginia, April 13, 1999
16. Department of Chemical Engineering, Yale, CT, November 11, 1999
17. Department of Chemistry, University of Illinois, IL, November 12, 1999
18. Department of Biochemistry, Virginia Tech, November 1, 1999
19. Adhesive and Sealant Council Meeting - "Where The Industry Meets", Pittsburgh, PA, November, 1999,
Rebecca Fall and William Ducker
20. Center for Adhesive and Sealant Science, Virginia Tech, October 20, 1999
21. Department of Chemistry, North Carolina Agriculture and Technological State University, NC, April 22, 1999
22. Department of Chemistry, Washington and Lee, VA, November, 1998

23. Helene Curtis Research Center, Chicago, August 10, 1997
24. Max Planck Institute for Metals Research, Stuttgart, Germany, June 24, 1996
25. Max Planck Institute for Polymer Research, Mainz, Germany, June 26, 1996
26. Institute for Surface Chemistry, Stockholm, Sweden, July 1, 1996
27. School of Mines, Columbia University, NY, January 5, 1996
28. Department of Biochemistry, University of Otago, NZ, August, 1995
29. Department of Chemistry, University of Canterbury, NZ August, 1995
30. Department of Chemistry, University of Otago, NZ, March, 1994
31. Department of Chemistry, University of Auckland, NZ, October, 1994
32. Department of Chemistry, University of Otago, NZ, June, 1994
33. Otago Pharmacy Department Seminar, NZ, 1994
34. Otago Neurology Seminar, October, NZ, 1994

Service

National Service

2012 Chair Elect, ACS Colloid and Surface Chemistry Division.
2013 Chair of ACS Colloid and Surface Chemistry Division.
2014 Past Chair of ACS Colloid and Surface Chemistry Division.

Reviewer for Journals:

Physics of Fluids, Journal of Colloid and Interface Science, Physical Review Letters, Langmuir, J. Physical Chemistry, J. Physical Chemistry B, Journal of Physical Chemistry C, Physical Review, Journal of Colloidal and Interface Science, Nature, Soft Matter.

Editing

Editorial Advisory Board, Langmuir
Section Editor, Current Opinion in Colloid and Interface Science

University Service, Virginia Tech

2014–2017 Member of Faculty Senate
Commission on University Policies and Studies
2016–2017 Academic Support Committee

Chemical Engineering Service

2011–present: Chair, Department of Chemical Engineering Graduate Committee, which includes student recruiting.
2011, 2013, 2014, 2016 Member, Department of Chemical Engineering Faculty Search Committee.
2008– Member, Department of Chemical Engineering Promotion and Tenure Committee.

Academic Courses Taught at the University of Otago

Course Name	Description	Approx. Num. of Students
Chemistry Honours	Surface and Colloid Chemistry	30
Chem. 336	Colloid and Surface Chemistry	70
Chem. 340	Spectroscopy	40
Chem. 341	Materials Chemistry	35
Chem. 231	Crystallography	150
Chem. 235	Biological Chemistry	180
Chem. 101	General Chemistry	800

Academic Courses and Teaching Evaluations at Virginia Tech

Semester	Course	Approx. Number of Students	Responses	Overall Rating
Spring 1998	Chem. 3615	60	37	2.3
Spring 1999	Chem. 3615	30	14	3.2
Fall 1999	Chem. 6664	22	15	3.1
Spring 2000	Chem. 3615	30	27	3.6
Fall 2000	Chem. 6624	21	16	3.4
Fall 2000	Chem. 5644	21	16	3.8
Spring 2001	Chem. 3615	15	8	3.8
Fall 2001	Chem. 3615	40	32	3.2
Spring 2002	Chem. 4616	45	33	2.8
Fall 2002	Chem 5644	25		
Spring 2003	Chem 4616	87	46	3.2
Fall 2003	Chem 5644	17	14	3.4
Fall 2008	CHE 2164	38	20	3.6
Fall 2009	CHE 2164	28	18	3.3
Spring 2010	CHE 4334	17	13	3.5
Spring 2010	CHE 5334G	1		
Fall 2010	CHE 2164	42		3.6
Spring 2011	CHE 4334	13		3.5
Spring 2011	CHE5334G	3		4.0
Summer II 2011	CHE 4014	36		
Fall 2011	CHE 2164	41		5.24
Spring 2012	CHE 4334	6		5.0
Spring 2012	CHE 5334G	2		6.0
Fall 2012	CHE 2164	46		5.33
Spring 2013	CHE 4334	2		6.0
Spring 2013	CHE 5334G	8		5.5
Fall 2013	CHE 2164	56		5.38
Spring 2014	CHE 3044	134		4.91
Fall 2014	CHE 2164	49		5.1
Spring 2015	CHE 3044	110		5.04
Fall 2015	CHE 2164	54		5.73
Spring 2016	CHE 3044	112		5.15
Fall 2016	CHE 2164			

Note: Scores prior to Fall 2011 have a maximum of 4 and subsequent to Fall 2011 have a maximum of 6.

Current Thesis

Advised

Name	Degree	Awarded	Thesis Title
Saaed Behzadinasab	Ph.D.	ongoing	
Zeichen Zhang	Ph.D.	ongoing	
Mohsen Hosseini	Ph.D.	ongoing	
Saurabh Sharma	M.Eng.	ongoing	

M.S. Thesis advisor to the following students:

Rattaporn (Ty) Chatchaidech (Micron then SK Hynix America)
Ching-Wen Chiu (Taiwan Semiconductor Manufacturing Company)
Kathryn Edgecombe (Cadbury)
Lachlan Grant (OPUS)
Jon Hittel (Dow)
Reuben Lamont (Office Max)

Ph.D. Thesis advisor to the following students:

Dirk Bokern (Sony)
Yow-Ren Chang (Intel)
Spencer Clark (Fresenius Medical Care)
Tim Davey
Prudvi Gaddam (Syngenta)
Annette Häbich
Chris Honig (University of Melbourne)
Chang Huyng Jang (Gachon University)
Dmitri Iarikov (Startup)
Alex Kriegel (US Navy)
Chang-Hyun Jiang
Mehdi Kargar (CEO, Maxterial)
Bill Lokar (Lynchburg College)
Dean Mastropietro (University of Chicago)
Clayton McKee (Biorad)
Wade Mosse (Operations Manager, SUEZ Recycling and Recovery)
Nathan Nicholas (University of Melbourne)
Milad Radiom
Dean Mastropietro (University of Chicago)
Dongjin Seo (Assistant Professor, Brigham Young University)
Julian Thimm (Universität Hamburg)
Aysen Tulpar (Dogus University, Turkey)
Zeichen Zhang (Current Student)

Postgraduate-Scholar sponsor/advisor to the following scientists, last five years:

Adam Bowles (Intel)
Chris Honig (University of Melbourne)
Htwe Mon (Current)
Dongjin Seo (Post-Doc, University of California, Santa Barbara)

University Service at Virginia Tech

Academic Support Committee 2016–2017

Faculty Senate 2014–2016