

**Maarten P. de Boer, updated Nov. 1, 2007**

**Journal Publications:**

**(502 citations according to Web of Science)**

32. F. W. DelRio, M. L. Dunn and M. P. de Boer, *Capillary adhesion model for contacting micromachined surfaces*, **submitted**, (Oct. 2007).
31. M. P. de Boer et al., *On-chip laboratory suite for free-standing metal film mechanical property testing, Part II*, **submitted**, (Sept, 2007).
30. M. P. de Boer et al., *On-chip laboratory suite for free-standing metal film mechanical property testing, Part I*, **submitted**, (Sept, 2007).
29. A. D. Corwin and M. P. de Boer, *A linearized method to measure dynamic friction of microdevices*, **submitted**, (Sept. 2007).
28. P. C. T. de Boer and M. P. de Boer, *Rupture work of pendular bridges*, *Langmuir*, **in press**, (2007).
27. M. P. de Boer and P. C. T. de Boer, *Thermodynamics of capillary adhesion between rough surfaces*, *J. Coll. Inter. Sci.*, **311**, 171-185 (2007).
26. F. W. DelRio, M. L. Dunn, L. M. Phinney, C. J. Bourdon and M. P. de Boer, *Rough surface adhesion in the presence of capillary condensation*, *Appl. Phys. Lett.*, **90** (16), 163104 (2007).
25. M. P. de Boer, *Capillary adhesion between elastically hard rough surfaces*, *Exp. Mech.*, **47** (1), 171 (2007).
24. F. W. DelRio, M. L. Dunn and M. P. de Boer, *Growth of silicon carbide nanoparticles using tetraethylorthosilicate for microelectromechanical systems*, *Electrochemical and Solid-State Letters*, **10** (1), H27-H30 (2006).
23. S. J. Koch, G. E. Thayer, A. D. Corwin and M. P. de Boer, *Micromachined piconewton force sensor for biophysics investigations*, *Appl. Phys. Lett.*, **89** 173901 (2006).
22. F. W. DelRio, M. L. Dunn, B. L. Boyce, A. D. Corwin and M. P. de Boer, "The effect of nanoparticles on MEMS adhesion," *J. Appl. Phys.* 99, 104304 (2006)..
21. E. E. Flater, A. D. Corwin, M. P. de Boer, and R. W. Carpick, *In-situ wear studies of surface micromachined interfaces subject to controlled loading*, *Wear*, 260 (6) 580 (2006).
20. M. B. Sinclair, M. P. de Boer and A. D. Corwin, *Long Working-Distance, Incoherent Light Interference Microscope*, *Applied Optics*, 44 (36) 7714 (2005) (**cover article**).
19. F. W. DelRio, M. P. de Boer, J. A. Knapp, E. D. Reedy, P. J. Clews and M. L. Dunn, *Role of dispersion forces in adhesion of micromachined surfaces*, *Nature Materials* **4** (8) 629 (2005).
18. A. D. Corwin and M. P. de Boer, *Effect of adhesion on dynamic and static friction in surface micromachining*, *Appl. Phys. Lett.*, **84** (13) 2451 (2004).
17. M. P. de Boer, D. L. Luck, W. R. Ashurst, A. D. Corwin, J. A. Walraven, and J. M. Redmond, *High-performance surface-micromachined inchworm actuator*, *J. Microelectromech. Syst.*, **13** (1) 63 (2004).
16. W. R. Ashurst, M. P. de Boer, C. Carraro, and R. Maboudian, *An investigation of sidewall adhesion in MEMS*, *Applied Surface Science*, **212-213** 735 (2003).
15. J. A. Knapp and M. P. de Boer, *Mechanics of microcantilever beams subject to combined electrostatic and adhesive forces*, *J. Microelectromech. Syst.*, **11** (6) 754 (2002).

14. M. S. Baker, M. P. de Boer, N. F. Smith, L. K. Warne, and M. B. Sinclair, *Integrated measurement-modeling approaches for evaluating residual stress using micromachined fixed-fixed beams*, J. Microelectromech. Syst., **11** (6) 743 (2002).
13. B. D. Jensen, M. P. de Boer, N. D. Masters, F. Bitsie, and D. A. LaVan, *Interferometry of actuated cantilevers to determine material properties and test structure non-idealities in MEMS*, J. Microelectromech. Syst., **10** (3) 336 (2001).
12. M. P. de Boer and T. M. Mayer, *Tribology of MEMS*, MRS Bull., **26** (4) 302 (2001).
11. J. G. Kushmerick, M. G. Hankins, M. P. de Boer, P. J. Clews, R. W. Carpick, and B. C. Bunker, *The influence of coating structure on micromachine stiction*, Tribol. Lett., **10** (1-2) 103 (2001).
10. M. P. de Boer, J. A. Knapp, T. A. Michalske, U. Srinivasan, and R. Maboudian, *Adhesion hysteresis of silane coated microcantilevers*, Acta Mater., **48** (18-19) 4531 (2000).
9. B. C. Bunker, R. W. Carpick, R. Assink, M. L. Thomas, M. G. Hankins, J. A. Voigt, D. L. Sipola, M. P. de Boer, and G. L. Gulley, *The impact of solution agglomeration on the deposition of self-assembled monolayers*, Langmuir, **16** 7742 (2000).
8. T. M. Mayer, M. P. de Boer, N. D. Shinn, P. J. Clews, and T. A. Michalske, *Chemical vapor deposition of fluoroalkylsilane monolayer films for adhesion control in microelectromechanical systems*, J. Vac. Sc. Tech. B, **18** (5) 2433 (2000).
7. J. J. Sniegowski and M. P. de Boer, *IC-compatible polysilicon surface micromachining*, Annu. Rev. Mater. Sci., **30** 297 (2000).
6. M. P. de Boer and T. A. Michalske, *Accurate method for determining adhesion of cantilever beams*, J. Appl. Phys., **86** (2) 817 (1999).
5. M. P. de Boer, J. C. Nelson, and W. W. Gerberich, *Thin film scratch testing in two dimensions-experiments and analysis*, J. Mater. Res., **13** (4) 1002 (1998).
4. M. P. de Boer, M. Kriese, and W. W. Gerberich, *Investigation of a new fracture mechanics specimen for thin film adhesion measurement*, J. Mater. Res., **12** (10) 2673 (1997).
3. M. P. de Boer and W. W. Gerberich, *Microwedge indentation of the thin film fine line .1. Mechanics*, Acta Mater., **44** (8) 3169 (1996).
2. M. P. de Boer and W. W. Gerberich, *Microwedge indentation of the thin film fine line .2. Experiment*, Acta Mater., **44** (8) 3177 (1996).
1. M. P. de Boer and S. Geller, *Low-temperature phases of the solid electrolyte  $Ag_{26}I_{18}W_4O_{16}$* , Journal of Solid State Chemistry, **48** (1) 121 (1983).

#### Articles Appearing in Books

4. R. W. Carpick, J. D. Batteas and M. P. de Boer, "Scanning probe studies of nanoscale adhesion between solids in the presence of liquids and monolayer films," Springer Handbook of Nanotechnology, 2<sup>nd</sup> edition (2006).
3. R. Ballarini, H. Kahn, A. H. Heuer, M. P. de Boer, and M. T. Dugger, *MEMS structures for on-chip testing of mechanical and surface properties of thin films*, in *Interfacial and Nanoscale Failure, Comprehensive Structural Integrity Series*, W.W. Gerberich and W. Yang, Editors. 2002, Elsevier: Oxford. (2003).
2. N. D. Masters, M. P. de Boer, B. D. Jensen, M. S. Baker, and D. Koester, *Side-by-side comparison of passive MEMS strain test structures under residual compression*, in

- Mechanical properties of structural thin films*, STP 1413, S. B. Brown and C. L. Muhlstein, Editors. 2001, ASTM: West Conshohocken, PA. pp. 168-200.
1. M. P. de Boer, N. F. Smith, N. D. Masters, M. B. Sinclair, and E. J. Pryputniewicz, *Integrated platform for testing MEMS mechanical properties at the wafer scale by the IMaP methodology*, in *Mechanical properties of structural thin films*, STP 1413, S. B. Brown and C.L. Muhlstein, Editors. 2001, ASTM: West Conshohocken, PA. p. 85-95.

#### Books Edited

2. H. Kahn, M. P. de Boer, M. Judy, and S. M. Spearing, eds. *Materials Science of Microelectromechanical Systems (Mems) Devices III*. Mater. Res. Soc. Proc. Vol. 657. 2001, Materials Research Society: Warrendale, PA.
1. M. P. de Boer, A. H. Heuer, S. J. Jacobs, and E. Peeters, eds. *Materials Science of Microelectromechanical Systems (Mems) Devices II* Mater. Res. Soc. Proc. Vol. 605. 2000, Materials Research Society: Warrendale, PA. 314 pages.

#### Conference Publications

30. F. W. DelRio, M. P. de Boer, L. M. Phinney, C. J. Bourdon and M. L. Dunn, *Van der Waals and capillary adhesion of microelectromechanical systems*, in Proceedings of ASME International Mech. Eng. Congress, Chicago, IL (Nov. 5-10, 2006).
29. A. D. Corwin, M. D. Street, R. W. Carpick, W. R. Ashurst, and M. P. de Boer, *Presliding tangential deflections can govern the friction of MEMS devices*. in *2004 ASME/STLE Joint International Tribology Conference*, Long Beach, CA (2004).
28. M. P. de Boer and P. C. T. de Boer, *Thermodynamics of capillary adhesion in MEMS*. In *Proc. ASME/STLE Joint International Tribology Conference*. Long Beach, CA (2004).
27. D. L. Luck, M. P. de Boer, W. R. Ashurst, and M. S. Baker, *Evidence for pre-sliding tangential deflections in MEMS friction*, in *Transducers 2003*, Boston, MA, pp. 404-407 (2003).
26. R. W. Carpick, E. E. Flater, J. R. VanLangendon, and M. P. de Boer, *Friction in MEMS: from single to multiple asperity contact*, in *Proc. Society for Experimental Mechanics Conference*, Milwaukee, WI (2002).
25. J. P. Sullivan, T. A. Friedmann, M. P. de Boer, D. A. LaVan, R. J. Hohlfelder, C. I. H. Ashby, M. T. Dugger, M. Mitchell, R. G. Dunn, and A. J. Magerkurth, *Developing a new material for MEMS: Amorphous Diamond*. in *Mater. Res. Soc. Proc vol 657*. Boston, MA, pp. EE7.1.1-7.1.9 (2001).
24. G. Subhash, A. D. Corwin, and M. P. de Boer, *Operational Wear and Friction in MEMS Devices*. in *Proc. ASME International Mechanical Engineering Congress*. Anaheim, CA (2004).
23. M. P. de Boer, D. L. Luck, J. A. Walraven, and J. M. Redmond, *Characterization of an inchworm actuator fabricated by polysilicon surface micromachining*. in *Proc. the SPIE vol. 4558*, R. Ramesham, Editor, San Francisco, CA, pp. 169-180 (2001).
22. M. P. de Boer, J. A. Knapp, and P. J. Clews, *Effect of nanotexturing on interfacial adhesion in MEMS*, in *Proc. International Conference on Fracture 10*, Honolulu, HI (2001).

21. M. S. Baker, M. P. de Boer, N. F. Smith, and M. B. Sinclair. *Measurement of residual stress in MEMS to sub megapascal accuracy*. in *Proc. Society for Experimental Mechanics*, Portland, OR (2001).
20. G. C. Brown, R. J. Pryputniewicz, M. P. de Boer, and N. F. Smith. *Dynamics of MEMS microengines using optoelectronic laser interferometry*. in *Mater. Res. Soc. Proc. Vol. 605*, pp. 163-168 (2000).
19. S. S. Mani, J. G. Fleming, J. A. Walraven, J. J. Sniegowski, M. P. de Boer, L. W. Irwin, D. M. Tanner, D. A. LaVan, M. T. Dugger, J. Jakubczak and W. M. Miller, *Effect of coating on microengine performance*, Proceedings of IRPS, pp.146-151 (2000).
18. S. S. Mani, J. G. Fleming, J. J. Sniegowski, M. P. de Boer, L. W. Irwin, J. A. Walraven, D. M. Tanner, and D. A. LaVan, *Selective W for coating and releasing MEMS devices*. in *Mater. Res. Soc. Proc. vol. 605*, pp. 135-140 (2000).
17. B. T. Crozier, M. P. de Boer, J. M. Redmond, D. F. Bahr, and T. A. Michalske. *Friction measurement in MEMS using a new test structure*, in *Mater. Res. Soc. Proc. vol. 605*, pp. 129-134 (2000).
16. Pulsed laser deposited coatings for stiction and wear reduction in MEMS devices, J. S. Pelt, M. E. Ramsey, R. Magana, E. Poindexter, M. P. de Boer, D. A. LaVan, M. T. Dugger, J. H. Smith, S. M. Durbin, *Proc. of the SPIE vol. 3874*, Santa Clara, CA, pp.76-84 (1999).
15. B. D. Jensen, M. P. de Boer, and F. Bitsie, *Interferometric measurement for improved understanding of boundary effects in micromachined beams*, in *Proc. of the SPIE vol. 3874*, Santa Clara, CA pp. 61-72 (1999).
14. B. D. Jensen, M. P. de Boer, and S. L. Miller, *IMaP: Interferometry for materials property evaluation in MEMS*, in *MSM '99*. San Juan, Puerto Rico, pp. 206-209 (1999).
13. M. P. de Boer, J. A. Knapp, T. M. Mayer, and T. A. Michalske. *Role of interfacial properties on MEMS performance and reliability*. in *Proc. of the SPIE vol. 3825*, Munich, Germany: pp. 2-15 (1999).
12. M. P. de Boer, B. D. Jensen, and F. Bitsie. *A small area in-situ MEMS test structure to measure fracture strength by electrostatic probing*. in *Proceedings of the SPIE vol. 3875*, Santa Clara, CA, pp. 97-103, (1999).
11. J. M. Redmond, M. P. de Boer, and T. A. Michalske, *Integrated modeling and testing of a microhinge structure for sliding friction measurement*, in *ASME conference, Symposium on Microscale Mechanics of Materials and Structures*, Anaheim, CA (1998).
10. M. P. de Boer, J. M. Redmond, and T. A. Michalske. *A hinged-pad test structure for sliding friction measurement in micromachining*. in *Proc. of the SPIE vol. 3512*, Santa Clara, CA, pp. 241-250 (1998).
9. M. P. de Boer, P. J. Clews, B. K. Smith, and T. A. Michalske, *Adhesion of polysilicon microbeams in controlled humidity ambients*, in *Mater. Res. Soc. Proc. vol. 518*, San Francisco, CA pp. 131-136 (1998).
8. M. P. de Boer, M. R. Tabbara, M. T. Dugger, P. J. Clews, and T. A. Michalske. *Measuring and modeling electrostatic adhesion in micromachines*. in *Proc. Int. Conf. Solid-State Sensors & Actuators (Transducers '97)*, vol 2. Chicago, IL, USA pp. 229-232 (1997).
7. M. P. de Boer and T. A. Michalske, *Improved auto-adhesion measurement method for micromachined polysilicon beams*, *Mater. Res. Soc. Proc. Vol. 444* pp. 87-92 (1997).

6. M. P. de Boer, J. C. Nelson, and W. W. Gerberich. *Mechanics of interfacial crack propagation in microscratching*. in Mater. Res. Soc. Proc. Vol. **444** pp. 87-92 (1997).
5. M. P. de Boer, H. Huang, and W. W. Gerberich. *Thin film adhesion evaluation by microwedge scratching of precracked fine lines*. in Mater. Res. Soc. Proc. Vol. **356** pp. 821-826 (1995).
4. M. P. de Boer, N. R. Moody, H. Huang, and W. W. Gerberich. *Thin film fine line work of adhesion by microwedge indentation*. in Mater. Res. Soc. Proc. Vol. **356** pp. 693-698 (1995).
3. M. P. de Boer, H. Huang, J. C. Nelson, E. T. Lilleodden, and W. W. Gerberich. *Cracking mechanisms of fine lines by microwedge scratch testing*. in *Materials Reliability in Microelectronics IV*. 1994. San Francisco, CA: Materials Research Society, pp. 513-518.
2. M. P. de Boer, H. Huang, J. C. Nelson, F. Wang, and W. W. Gerberich. *Adhesion tungsten fine lines on SiO<sub>2</sub> by micro-wedge scratching*. in *Interface Control of Electrical, Chemical, and Mechanical Properties Symposium*. 1993. Boston, MA: Materials Research Society, pp. 609-614.
1. M. P. de Boer, J. E. Angelo, A. M. Dabiran, P. I. Cohen, and W. W. Gerberich. *Characterization of low temperature GaAs(111)B MBE growth by AFM and TEM*. *MRS Proceedings vol. 280*. 1992. Boston, MA: Materials Research Society, pp. 631-634.