

## **Dr. Yonggang Meng**

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State Key Laboratory of Tribology (SKLT)  
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## **Education**

1978.9-1982.7: B.E., Mechanical Engineering, Inner Mongolia University of Technology, China  
1982.9-1983.9: Graduate student, Mechanical Engineering, Northwestern Polytechnical University, China  
1983.10-1986.3: M.S., Mechanical Engineering, Kumamoto University, Japan  
1986.4-1989.3: Ph.D., Mechanical Engineering, Kumamoto University, Japan

## **Employment History**

1999—present, Professor, State Key Laboratory of Tribology, Tsinghua University  
1993—1999, Associate Professor, State Key Laboratory of Tribology, Tsinghua Univ.  
1992—1993, Lecturer, State Key Laboratory of Tribology, Tsinghua Univ.  
1995.6—1995.9, Visiting Research Fellow, Kumamoto Univ., Japan  
1997.3—1997.9, Croucher Foundation Research Fellow, City Univ. of Hong Kong, Hong Kong  
2001.7—2002.4, Visiting scholar, The University of Michigan, Ann Arbor, USA

## **Research Interests**

- Active Friction Control: Electrochemical control of boundary lubricating films; Aqueous lubrication; Friction modeling; Surface texture effect on lubrication and friction; Friction clutches; Tribological design of machine elements.
- Smart Materials and Surfaces: Electrorheological and magnetorheological fluids/elastomers; Application of piezoelectric and magnetostrictive materials; Smart surfaces.
- MEMS/NEMS: Experiment evaluations of mechanical and tribological properties of micro/nano-components; Bioinspired Microsystems; Nano-positioning and nano-fabrication.
- Ultra-thin Film Gas Lubrication: Molecular gas lubrication and Direct Simulation Monte Carlo; Analysis and design of head sliders in hard-disk drivers; Measurement of flying head attitude.

## **Career Highlights**

### **Patents:**

1. Y. Meng, Y. Tian, Y. Ao, Power source for actuating piezo-devices, China Invention Patent, ZL 98102187.5
2. Y.Meng, Y. Ao, Y. Tian, High voltage high speed switching circuit for ER devices, China Invention Patent, CN 1206961A.
3. Meng, Y. Tian, Y. A preparing process for making electrorheological fluids with strong ER effect, China Invention Patent, CN1255708A.
4. Y.Meng, H.Jiang, et.al., A method for active control of frictional behavior of metal/ceramics tribopairs, China Invention Patent, CN1223348A

### **Awards:**

1. Y. Meng, Y.Tian, Q. Zhao, et. al., Control of Machine

Lubrication and Interfacial Behavior by Electromagnetic Fields, First Class Prize, Natural Science Awards of Chinese High Education, 2013.

2. Y. Tian, Y. Meng, S. Wen, The principles of Active Control of the Mechanical Properties of Electrorheological Fluids and Its Applications, Second Class Prize, Natural Science Awards of Chinese High Education, 2008.

**Selected Peer-reviewed Publications in the past 3 years:**

- (1) Xiaoyong Yang, Yonggang Meng, Yu Tian, Potential Controlled Boundary Lubrication of Stainless Steels in Non-aqueous Sodium Dodecyl Sulfate Solution. Tribology Letters, DOI:10.1007/s11249-013-0240-9,2013.
- (2) Sihan Shen, Yonggang Meng, Effect of Surface Energy on the Wear Process of Bulk-fabricated MEMS Devices, Tribology Letters, 52,213-221,2013.
- (3) Qiang Yu, Qian Zhao, Yonggang Meng, An impedance-permeability self-resonance of inductance coil with metamaterials , Progress In Electromagnetics Research, 138, 21-30, 2013.
- (4) Zilian Qu, Qian Zhao, Yonggang Meng, Tongqing Wang, Dewen Zhao, Yanwu Men, Xinchun Lu, In-Situ Measurement of Cu Film Thickness during the CMP Process by Using Eddy Current Method Alone, Microelectronic Engineering, 108:66-70, 2013.
- (5) Zilian Qu, Qian Zhao, Yonggang Meng, Improvement of eddy current sensor sensitivity for nano-scale thickness measurement of Cu films , NDT & E International, 61,53-57,2014.
- (6) Zilian Qu, Qian Zhao, Yonggang Meng, Online measurement of water concentration of oil-water mixtures in the flow of pipeline by using eddy current method, Measurement Science and Technology,

24,125304, 2013.

- (7) Zhou, Ming; Tian, Yu; Sameoto, Dan; Zhang, Xiangjun; Meng, Yonggang; Wen, Shizhu, Controllable Interfacial Adhesion Applied to Transfer Light and Fragile Objects by Using Gecko Inspired Mushroom-Shaped Pillar Surface, ACS Applied Materials & Interfaces, DOI:10.1021/am402815x, 2013
- (8) Cuihong Li, Yonggang Meng, Yu Tian, Recession in a linear stepper motor based on piezoelectric actuator and electrorheological clampers, Smart Materials and Structures, 21 (12), No.125008, (2012).
- (9) Xiangjun Zhang, Xiaoxiang Liu, Xiaohao Zhang, Yu Tian, Yonggang Meng, Ordering of the 7CB liquid crystal induced by nanoscale confinement and boundary lubrication, Liquid Crystal, 39(11): 1305-1313, 2012.
- (10) Xiangjun Zhang, Ying Huang, Yuanyuan Wang, Yu Tian, Yonggang Meng, Effects of inhomogeneous substrate and molecular orientation the AC electrowetting behavior of liquid crystal droplet, Journal of Adhesion Science and Technology, 26(12-17):1985-2000, 2012.
- (11) Ming Zhou, Noshir Pesika, Hongbo Zeng, Jin Wan, Xiangjun Zhang, Yonggang Meng, Shizhu Wen, Yu Tian, Design of gecko-inspired fibrillar surfaces with strong attachment and easy-removal properties: numerical analysis of peel-zone, Journal of the Royal Society Interface, 9(75):2424-2436, 2012.
- (12) Ning Li, Yonggang Meng, D. Bogy, Experimental Study of the Slider-Lube/Disk Contact State and its Effect on Head-Disk Interface Stability, IEEE Transactions on Magnetics, 48(8): 2385-2391, 2012.
- (13) Jinyu Zhang, Yonggang Meng, A Study of Surface Texturing of Carbon Steel by Photochemical Machining, Journal of Materials Processing Technology, 212, 2133-2140, 2012

- (14) Sihan Shen, Yonggang Meng, A Novel Running-in Method for Improving Life-time of Bulk-fabricated Silicon MEMS Devices, *Tribology Letters*, 47 (2): 273-284, 2012.
- (15) Sihan Shen, Yonggang Meng, Wei Zhang, Characteristics of the Wear Process of Side-Wall Surfaces in Bulk-Fabricated Si-MEMS Devices in Nitrogen Gas Environment, *Tribology Letters*, 47(3):455-466,2012.
- (16) Jinyu Zhang, Yonggang Meng, Direct Observation of Cavitation Phenomenon and Hydrodynamic Lubrication Analysis of Textured Surface, *Tribology Letters*, 46 (2): 147-158, 2012.
- (17) Jile Jiang, Tian Yu, Yonggang Meng, Role of external magnetic field during friction of ferromagnetic materials, *Wear*, 2011, 271: 2991– 2997.
- (18) Jile Jiang, Yu Tian, Dongxue Ren, Yonggang Meng, Experimental study on the normal stress of magnetorheological fluids, *Smart Materials and Structures*, 2011, 20(8): 085012.
- (19) Ming Zhou, Yu Tian, Noshir Pesika, Hongbo Zeng, Jin Wan, Yonggang Meng, Shizhu Wen, The extended peel zone model: effect of peeling velocity, *Journal of Adhesion*, 87(11):1045-1058, 2011.
- (20) Ning Li, Yonggang Meng, D.Bogy, Effects of PFPE lubricant properties on the critical clearance and rate of the lubricant transfer from disk surface to slider, *Tribology Letters*, 43 (3): 275-286, 2011.
- (21) Yu Tian, Minliang Zhang, Jile Jiang, N. Pesika, Hongbo Zeng, J. Israelachvili, Yonggang Meng, Shizhu Wen, Reversible shear thickening at low shear rates of electrorheological fluids at electric fields, *Physical Review E*, 83(1), 011401, 2011.
- (22) Jile Jiang, Yu Tian, Yonggang Meng, A structure parameter of electrorheological fluids in shear flow, *Langmuir*,

2011,27(1):5814–5823.

- (23) Siqing He, Yonggang Meng, Yu Tian, Correlation between Adsorption/Desorption of Surfactant and Change in Friction of Stainless Steel in Aqueous Solutions under Different Electrode Potentials, *Tribology Letters*, 41(3), 485-494, 2011.

### **Book Chapters**

- (1) Yonggang Meng, “Gas Lubrication in Nano-gap”, Chapter 6, in “Physics and Chemistry of Micro/Nano-Tribology” edited by Jianbin Luo, Yuanzhong Hu and Shizhu Wen, ASM International, 2008.
- (2) Yonggang Meng, Chapter 2 “Lubricants” and Chapter 3 “Solid Friction”, in “Tribology Course” edited by Ping Huang, Yonggang Meng and Hua Xu, High Education Publishing, Beijing, 2008, (in Chinese).
- (3) Q Jane Wang and Yip Wah Chung, *Encyclopedia of Tribology, Effect of Electrostatic field on Adhesion*, 2012, Springer.
- (4) Q Jane Wang and Yip Wah Chung, *Encyclopedia of Tribology, Effect of Electrostatic field on Friction*, 2012, Springer.

### **Synergistic Activities**

Senior Member of Chinese Mechanical Engineering Society

Member of STLE

Associate Editor, *Friction*, 2013-present

Editorial Board Member, *Tribology Letters*, 2011-present

Editorial Board Member, *Chinese Mechanical Engineering*, 2012-present.