

CURRICULUM VITAE

LAWRENCE KULINSKY

POSITION: Project Scientist

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CITIZENSHIP: USA

EDUCATION:

- 12/1998 **Ph. D.** in Materials Science and Engineering with Minor in Biomedical Engineering, (*GPA*: 3.8 on 4.0 scale), **University of California, Berkeley**
12/1995 **M. S.** in Materials Science and Engineering, **University of California, Berkeley**
12/1993 **B. S.** in Materials Science and Engineering, **University of California, Berkeley**

CAREER INTERESTS

Academic position in Biomedical Engineering and Materials Science fields

PROFESSIONAL RESEARCH INTERESTS:

Fluid dynamics, fluid mechanics of biological systems, nanotechnology, microfluidics, biosensors, drug delivery systems.

ACADEMIC APPOINTMENTS:

Project Scientist

6/2005 - present

BioMEMs Research Group, University of California, Irvine

- Direct research of 7 graduate students in the areas of drug delivery systems, electroactive polymers, biosensors, micromachining, fluid dynamics. Promoted from *Research Specialist IV* to *Project Scientist* July 2006.

Lecturer

Summer Sessions, University of California, Irvine

8/2006 – 9/2006

- Designed and taught MAE120 “Heat Transfer” class. Evaluations are available upon request.

Research Fellow

1/1999 – 1/2000

University of California, Berkeley, Berkeley, CA

- Performed surface energetics study in Al₂O₃ crystals and Si bi-crystals. Results of experiments confirmed the role of Ti valency in changes of surface energy states.

Research Assistant 1/1996 – 12/1998
Biomedical Microdevices Center, University of California, Berkeley, CA

- Used bulk and surface micromachining to produce capillary channels for study of microfluidics. Performed experiments and theoretical analysis to show how fluid flow of polar liquids in the narrow capillaries is dramatically different from the fluid flow in macroscopic channels. Results of the study are applied for protein separations, biological flow in capillaries and bioMEMS.

Graduate Student Instructor 9/1997 – 8/1998
University of California, Berkeley, CA

- Worked as a teacher assistant instructing students in discussion sections and laboratory exercises in sophomore-level class *Properties of Materials* and senior-level class *Experimental Materials Science*.

Research Assistant 1/1992 – 12/1995
Ceramics Laboratory, Department of Materials Science, University of California, Berkeley, CA

- Used lithographic techniques and bulk silicon micromachining to introduce controlled-geometry microvoids in the sapphire crystal. Performed study of high-temperature morphological evolution of the voids revealed important information about the surface energetics of Al₂O₃ crystal.

Research Assistant 9/1989 – 12/1990
Moscow Institute of Steel and Alloys, Moscow, Russia

- Composed FORTRAN computer code for the temperature controller of high precision alloy furnace.

CONSULTING/ ENGINEERING ACTIVITIES:

Sr. Design Engineer 2/2000 – 12/2005
High Voltage R&D Group, International Rectifier Corp., El Segundo, CA

- Applied an expertise in design and process of majority carrier and bipolar high-power semiconductor devices (MOSFETs and IGBTs) as well as in semiconductor packaging solutions. Invented novel packaging design (Patent IR-1885 Prov (2-2331)). Led development project that resulted in more than 22 millions USD of projected revenue for the company.

SUMMARY OF SKILLS

Surface and Bulk Micromachining: UV Lithography (mask design; work with various mask aligners; photoresist coating, exposure and development), E-beam Lithography, Wet and Dry Etch (EDP and KOH selective etch, plasma etch, HF, ion beam etch), Oxide and Nitride Deposition Systems

Characterization Techniques: TEM, SEM, X-ray Diffraction, Optical Microscopy, Topological Characterization (profilometer, thin film measurement system etc.)

Computer Skills: Fortran and Assembly programming languages, advanced software for mathematical computations such as *Mathematica* and *Mathcad*.

PROFESSIONAL SERVICE AND ACTIVITIES:

Member of American Society of Mechanical Engineers

Member of Society for the Advancement of Material and Process Engineering

Member of the International Society for Optical Engineering

PATENTS

U.S. Patent **6,768,211**

U.S. Patent **6,621,166** “Five layer adhesive/insulator/metal/insulator/adhesive tape for semiconductor die packaging” Inventor: L. Kulinsky

PUBLICATIONS

REFEREED JOURNAL PAPERS

- J1 L. Kulinsky, J. D. Powers, and A. M. Glaeser, “Effects of Controlled-Geometry Sinusoidal Perturbations on the Morphological Evolution of Pore Channels in Sapphire”, *International Ceramic Monographs*, **1**, [1], 268-73 (1994)
- J2 L. Kulinsky, J. D. Powers, and A. M. Glaeser, “Morphological Evolution of Pre-Perturbed Pore Channels in Sapphire”, *Acta Materialia*, **44**, [10], 4115–30 (1996)
- J3 M. Kitayama, J. D. Powers, L. Kulinsky, and A. M. Glaeser, “Microdesigned Interfaces: New Opportunities for Studies of Surfaces and Grain Boundaries”, *Ceramic Microstructures '96*
- J4 M. Kitayama, J. D. Powers, L. Kulinsky, and A. M. Glaeser, “Surface and interface properties of alumina via model studies of microdesigned interfaces”, *Journal of the European Ceramic Society*, **19** [13] 2191–2209 (1999)
- J5 T. Desai, D. Hansford, L. Kulinsky, A. Nashat, G. Rasi, J. Tu, Y. Wang, M. Zhang, and M. Ferrari, “Nanopore technology for biomedical applications”, *Biomedical Microdevices*, Volume 2 (2000)
- J6 H-K A. Tsai, K-S Ma, C. Wand, H. Xu, C. Wang, J. Zoval, L. Kulinsky, and M. Madou, “Development of Integrated Protection for Miniaturized Implantable Controlled Drug Delivery System”, *Journal of Smart Materials and Structures*, accepted for publication 09/2006

PROCEEDINGS OF CONFERENCES:

- C1 J. D. Powers, L. Kulinsky, M. Kitayama, and A. M. Glaeser, “Effects of Titanium Doping on Surfaces and Interfacial Properties of Alumina”, *Structure and Properties of Interfaces and Ceramics: MRS Symposia Proceedings* **357**, 313–18, Materials Research Society (1995)

- C2 L. Kulinsky, Y. Wang, M. Ferrari, “Electroviscous effects in microchannels”, *Proc. SPIE* **3606**, 158 (1999)
- C3 L. Kulinsky, H. Xu, H-K A. Tsai, and M. Madou, “System-based approach for an advanced drug delivery platform”, *Proc. SPIE* **6173**, 61730M (2006)
- C4 H-K A. Tsai, K-S Ma, J. Zoval, L. Kulinsky, and M. Madou, “Packaged Au-PPy valves for drug delivery systems”, *Proc. SPIE* **6168**, 61681E (2006)
- C5 H. Xu, C. Wang, L. Kulinsky, J. Zoval, and M. Madou, “Sensor-integrated polymer actuators for closed-loop drug delivery system”, *Proc. SPIE* **6172**, 61720R (2006)
- C6 H. Xu, H-K A. Tsai, L. Kulinsky, and M. Madou, “Electroactive Polymer Use in Novel Drug Delivery Applications”, *Proc. SAMPE* (2006)