J. Thomas Dickinson
WSU Eminent Professor

**Regents Professor of Physics and Materials Science**
**Paul A. Anderson Professor of Physics**
**Washington State University**
**Pullman, WA 99164-2814**

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**e-mail:** jtd@wsu.edu

Born: March 9, 1941, Detroit, Michigan

Married: Wife (Diane), M. S. Computer Sci., Systems Programmer, WSU Computing Center, one child (Jennifer).

**EDUCATION:**

Western Michigan University, 1963, B.A. Physics and Mathematics (magna cum laude, Honors in Physics, Graduate of WMU Honors College-first graduating class)

University of Freiburg, Germany, 1962 (course work in physics, mathematics, German)

University of Michigan, 1964 M.S. Physics

University of Michigan, 1968 Ph.D. Physics -- Molecular Beam Spectroscopy, Advisor: Jens Zorn.

 Thesis Title: *Hyperfine Structure of TlBr by Molecular Beam Radiofrequency Spectroscopy*

**EXPERIENCE:**

Assistant Professor of Physics, Washington State University, 1968-74.

Associate Professor of Physics and Chemical Physics, Washington State University, 1974-79.

Visiting Scientist, Chemical Engineering, Stanford University, 1974.

Visiting Scientist, Applied Physics, Oregon Graduate Center, 1975.

Visiting Scientist, NASA-Ames Research Center, Summers, 1976-1985.

Professor of Physics and Chemical Physics, Washington State University, 1979-present.

Director, Center for Materials Research, Washington State University, 1988-1993;

Graduate Faculty, Mechanical and Materials Engineering, 1990-present.

Professor of Materials Science, 1990-present.

Director, Center for Materials Research, Washington State University, 1991-1994.

**HONOR SOCIETIES:**

Kappa Rho Sigma

Omicron Delta Kappa

Sigma Xi

**PROFESSIONAL SOCIETIES:**

 American Physical Society (Fellow)

American Association of Physics Teachers

American Vacuum Society (Fellow)

American Association for the Advancement of Science (Fellow)

American Chemical Society

Materials Research Society (Fellow)

SPIE (Fellow)

OSA

**COMMITTEE SERVICE AT WSU:**

***University***

 Member, Subcommittee of Catalog Committee on G.R.U., 1972.

Member, Cross-College Coordinating Committee, 1978.

Member, School of Engineering Advisory Council, 1983-84.

Member, Search Committee, Vice Provost for Research, 1986-87.

Member, University Task Force on Research & Grad. Education, 1987-88.

Co-Chairman, Committee for Materials Research Center, 1987-1995.

Co-Chairman, Committee for Materials Science Graduate Program, 1987-1999.

Member, Advisory Committee, Molecular Sciences Initiative, 1988.

Member, Search Committee, Dean, Division of Sciences, 1988-90.

Member, College of Engineering and Architecture Tenure and Promotion Advisory Committee, 1989.

Member, Catalog Sub-Committee, 1990-1992.

Co-Chairman, Review Committee for Ph.D. Degree in Engineering Science, 1993.

Member, University President’s Teaching Recognition Committee 1996-99.

Member, Search Committee, Vice Provost for Research, 2002-2003.

Member, Selection Committee, Distinguished Faculty Address Award, 2003-present.

Elected to WSU Teaching Academy, 2004-present.

Chair, University Committee on Undergraduate Research, Original Scholarship, and Creative Activity, 2004-present

Member, Graduate Mentor Academy (WSU Graduate School), 2004-present.

Member, Graduate Education Council; Chair of Interdisciplinary/Multidisciplinary Program task force, 2005-2006

Member, Search Committee, Dean of College of Engineering, 2005-2006.

Advisory Committee, Materials Science Program, 2006-present.

Selection Committee, Eminent Professor Award, 2011-present.

Dean’s Selection Committee, Regent’s Professor, 2012-present.

***Department or Division***

Member, Committee on Instruction, 1969-70.

Chairman, Committee on Instruction, 1970-71, 1977-79.

Member, Search Committee for Chairman of Physics, 1976-77.

Division of Science Physics-Chemistry-Engineering Liaison Committee, 1971-72.

Director, Chemical Physics Undergraduate Research Program, Summers 1971, 1972.

Seminar Leader "Interact 1974," Department of Architecture, WSU.

Physical Sciences-Engineering Subcommittee, Graduate School Research Committee, 1977, 1980,-84, -86, -87.

Member, Physical/Mathematical Sciences Advisory Council, 1983-1986.

Member, College of Engineering Advisory Committee on Tenure and Promotion, 1984, 1989.

Member, Division Technical Services Committee, 1985-present.

Member, Physics Department Undergraduate Studies Committee, 1980-present.

Chairman, Search Committee, Physics Faculty Position, 1984-85.

Member, Search Committee, Chemical Physics Position, 1986-87.

Chairman, Search Committee, Physics Faculty Position, 1988-89.

Member, Search Committee, Physics Faculty Position, 1989-90.

Chairman, Search Committee, Physics WSU Tri-Cities Faculty Position, 1991-92.

Member, Search Committee, Physics Faculty Position, 1993-94

Chairman, Search Committee, Physics Faculty Position, 1997-98

Member, Search Committee, Laboratory Supervisor in Physics, 1998-99.

Advisor, Physics Majors, 2001-present.

Chair, Undergraduate Studies Committee, 2001-present.

Undergraduate Recruiting Coordinator, 2001-present

Chair, Search Committee, Physics Instructor Position, 2002-2003

Member, Search Committee, Physical Chemistry Faculty Position, 2002-2004.

Member, Search Committee, Band Professor of Theoretical Physics, 2002-2003

Member, College of Sciences Tenure and Promotion Committee, three

Member, College of Sciences Committee on Integrated Science, 2004-2010

Member, Honors College Advisory Committee, 2009-2013

**COURSES TAUGHT:**

 Physics for Engineers and Scientists (2 semester course) HONORS

 Developed Laboratory Course for above

 Introductory Physics (non-calculus)

 Physics and Society (see related publication)

 Environmental Science (one week/semester--Energy)

 Honors Physics (First and Second Semester) with Recitation

 Modern Physics

 Mechanics

 Electricity and Magnetism (2 semester course)

 Advanced Undergraduate Laboratory

 Solid State Physics

 Advanced Atomic Physics

 Molecular Spectroscopy

 Methods of Spectroscopy and Surface Analysis

 Mathematical Physics (2 semester course)

 Optoelectronics Laboratory (2 two week experiments)

 Freshman Physics Seminar (coordinator and speaker)

 Mathematica for the Physical Sciences

 Physics and Astronomy Undergraduate Thesis

 Seminar courses in Surface Science, Condensed Matter, Materials Physics, Atomistics of Fracture, Defects on Surfaces, Fractals-Chaos in Materials Science, STM and AFM, Electron and Laser Beam Surface Interactions, Teaching Undergraduate Lab, Laser Physics and Applications, Design and Techniques in Experimental Science, Materials Chemistry, Laser Ablation and Desorption, Optical Properties of Solids, Nanotechnology.

***Recent Projects:***

        Facilitating examination of issues concerning the role of e-Learning in WSU’s mission to maintain excellence in undergraduate education; seeking funds for support for WSU faculty to develop experimental courses using e-Learning techniques. Giving talks on-campus examining e-Learning. (2012-present).

        Developing a Hybrid (Blended) Course (all lectures online) with in class tutoring, example problems, quizzes, exams. Course: Physics 342 (Electricity and Magnetism) Spring 2013

        Extending above to Physics 341 Fall 2013.

    Developed a Computerized Tutoring and Quizzing system based on *Mathematica* for serious and challenging mathematical based issues in physics. The student is given some background material and then asked to solve (sometimes only part of) a problem or small derivation that has steps where equations can be entered – the program can determine if the equation is correct; if not the program can offer hints, help, info and offer a re-try. Closely related questions can be offered also. Complete correct solutions can be part of the package if desired – a button takes you there if the instructor so wishes.

***Undergraduate Research:***

        Major proponent for appointment of a Undergraduate Research Director and University funding of undergraduate research at WSU (2000-present).

        Mentored ~ 1-2 students every year (often in summer). ~80% of the work is published.

**PROFESSIONAL SERVICE AND RECOGNITION:**

NSF Graduate Fellow, U. Michigan, 1963-65.

Invited Participant-Commission on College Physics Lab Workshop, 1970.

NASA-ASEE Faculty Fellow, 1976.

NSF International Travel Grant (1979).

Holland Travel Grant (1980).

Visiting Distinguished Professor, Japanese National Defense Academy, Yokosuka, Japan, Sept./Oct. 1988

Visiting Distinguished Professor, Instituts für Werkstoffwissenschaften und -technologie,Technischen Universität, Berlin, Oct/Nov. 1990.

**Washington State University Distinguished Faculty Address Award, 1991.**

3M Corporation Faculty Grant, 1991-94.

Invited Speaker at 16 Gordon Research Conferences, including *Elastomers, Glass, Composites, Adhesion, Particle-Solid Interactions, Laser Ablation, Fractals, Rock Deformation*, and *Tribology*.

**Washington State University President's Faculty Excellence Award in Research and Creative Activity, 1993.**

**Elected Fellow, American Vacuum Society, 1993 (first year AVS Fellows were chosen).**

**Washington State University College of Sciences Distinguished Research Faculty Award, 1994.**

Westinghouse Faculty Award in Materials Science, 1994.

**Chair, Gordon Conference** on Laser Interactions with Materials, June, 1996.

Visiting Distinguished Professor, Abteilung für Angewandte Physik der Johannes-Kepler-Universität Linz Oct/Nov. 1998.

Visiting Distinguished Professor, Institute for Lasers and Electronics, FORTH, Crete, Greece, Oct. 2000; January, 2001.

**Thomas Lutz Teaching Excellence Award, College of Sciences, 2001**.

**Named Paul A. Anderson Professor of Physics, Washington State University, June, 2002.**

Vice-Chair, Gordon Conference on Laser-Surface Interactions, July, 2002.

**Elected Fellow, American Physical Society, 2002.**

**Marian E. Smith Faculty Achievement Award in Teaching, 2003.**

The Distinguished Alumni Award, Western Michigan University, 2003.

**Chair, Gordon Conference** on Laser-Surface Interactions, July, 2004.

Vice-Chair, Gordon Conference on Tribology, June, 2004.

**Named Regents Professor, WSU, 2004.**

**Chair, Gordon Conference** on Tribology, 2006.

**Elected Fellow, American Association for the Advancement of Science (AAAS), 2005**

**WSU Sahlin Faculty Excellence Award for Instruction, 2006.**

**WSU Freshmen Convocation Address, 2006.**

William Williams Award, Department of Physics, University of Michigan, 2007.

**WSU Eminent Professor Award, 2007.**

**WSU Freshmen Convocation Address, 2007.**

**Elected Fellow, Materials Research Society (First year MRS Fellows were chosen), 2008.**

**WSU Honors College Undergraduate Research Mentor Award, 2008.**

**Elected Fellow, The International Society for Optics and Photonics (SPIE), 2008.**

**College of Arts and Sciences Outstanding Career Achievement in Scholarship/Creative Activities Award**

**Professional Service**

Produced Annotated Translation of "Concerning the Quantization of Direction in a Magnetic Field" by W. Gerlach and O. Stern, for Educational Services, Inc., 1966 (for an educational film on the Stern-Gerlach experiment)., 1967.

Director (Board Member) of Pacific Northwest Association for College Physics, 1970-73.

Evaluated several manuscripts for physics texts for publishers.

Presented numerous talks and served on panels throughout Pacific Northwest concerning energy and science and society issues.

Referee for: Surface Science, Applications of Surface Science, Physics Letters A, J. Vac. Sci. Technol., Surface Science Letters, Catalysis Lett., J. Mat. Research, J. of Adhesion, J. Am. Chem. Soc.., Geophysical Research Letters., J. Phys. and Chem. of Solids, Ferroelectrics Rev., Phys. and Chem. of Minerals, J. Phys. D: Appl. Phys., J. Am. Ceramics Soc., J. Trib. Lett., J. Phys. Chem. A and B, Chem. Reviews, Langmuir, Science.

Referee for Proposals: NSF, DOE, ACS-PRF, Research Corporation, NRC, DOD, ISF, NSREC.

Member, Washington Technology Center Advisory Committee, 1984-85.

Presented Program "Physics of Breaking Things" at Washington Young Scientists Conference, May, 1984.

Member, Program Committee, American Vacuum Society National Meeting, 1984-85.

Participant, Peer Review Committee, Physical Sciences Branch, NASA Ames Research Center, 1985.

Member, Pacific Northwest Materials Research Council, 1986-89.

Member, Program Committee, MRS Symposium: Atomic and Molecular Processing of Electronic and Ceramic Materials: Preparation, Characterization, and Properties, August, 1987.

Member, Advisory Board, International Symposium on Exoelectron Emission and Applications, from 1988 to present.

Co-Chair, Topical Sessions on Brittle Fracture, APS March Meeting, New Orleans, 1988.

Member, Program Committee, PNWMC Symposia on "Science of Materials,” 1989.

Participant, NASA Workshop on Contamination Problems on Space Station, Nov. 1987.

Participant, ONR and NIST Workshop on Fundamental Concepts in Theory of Fracture, Gaithersburg, 1989.

Symposium Chair: "Fracture and Deformation of Ceramics" Pacific Coast Meeting of American Ceramics Society Meeting, Oct., 1990.

Session Chair at numerous APS March Meetings, American Ceramics Society, American Vacuum Society.

Trustee, Pacific Northwest Chapter of the American Vacuum Society, 1990-91.

Vice-President, Pacific Northwest Chapter of the American Vacuum Society, 1992.

Chairman, Pacific Northwest Chapter of the American Vacuum Society, 1993-94.

Member, Steering Committee for Materials Science--Molecular Sciences Center, Battelle PNL, 1990-91.

Editorial Board, *Journal of Adhesive Science and Technology*, 1992-2002.

Co-Chair, Topical Sessions on “Electronic Processes in Laser Desorption/Ablation,” APS March Meeting, Seattle, 1993.

Washington State University President's Faculty Excellence Award in Research and Creative Activity, 1993.

Washington State University College of Sciences Distinguished Research Faculty Award, 1994.

Outside Reviewer, Materials Science, Battelle-PNNL, July, 1994.

Co-Chair, Symposium on Laser Processing of Materials, APS March Meeting, 1995.

Co-Chair, Symposium on Energetic Processes in Thin Film Growth, MRS Spring Meeting, 1995.

Chairman, Gordon Conference on Laser Interactions with Materials, June, 1996.

Member, Organizing Committee, Conference on Laser Ablation III, 1995 and COLA IV, 1997, COLA VI, 1999

Peer Reviewer, EMSL, Battelle-PNNL, June, 1997.

Peer Reviewer, LBNL-Chemical Sciences, March, 1998.

Visiting Professor, Abteilung für Angewandte Physik der Johannes-Kepler-Universität Linz Oct/Nov. 1998.

Co-Chair, Topical Sessions on “Physical Processes in Laser Desorption/Ablation,” APS March Meeting, Atlanta, 1999.

Member, User Advisory Committee, EMSL-Pacific Northwest National Laboratory, 2000-2007.

Chairman, Pacific Northwest Division of the American Vacuum Society 2000; annual meeting chair, Sept. 2000.

Visiting Professor, Institute for Lasers and Electronics, FORTH, Crete, Greece, Oct. 2000; January, 2001.

Member, Organizing Committee, SPIE Symposium: Laser Applications in Microelectronic and Optoelectronic Manufacturing V, January, 2001.

Member, Organizing Committee, Advanced Laser Technologies Conference, Constanta, Romania, Sept. 2001.

Co-Chair, Conference on Laser Ablation (COLA VI), Tsukuba, Japan, Oct. 2001

Member, American Vacuum Society Education Committee; Chair of undergraduate research award sub-committee (2001-present).

Co-Chair, Symposium on Non-Linear and Ultra-fast Laser Interactions with Materials, American Physical Society, March, 2002.

Chair, Topical Session on Polymers, SPIE International Symposium on High-Power Laser Ablation, Taos, April, 2002.

Vice-Chair, Gordon Conference on Laser-Surface Interactions, July, 2002.

Chair, Gordon Conference on Laser-Surface Interactions, July, 2004.

Vice-Chair, Gordon Conference on Tribology, August, 2004.

Member, Organizing Committee, SPIE Symposium: Laser Applications in Microelectronic and Optoelectronic Manufacturing VIII, January, 2003, 2004.

Reviewer, NSF National Nanotechnology Infrastructure Network (NNIN) Program, 2003.

Member, Organizing Committee, International Conference on Photo-Excited Processes and Applications, Sept. 2004, Leece, Italy.

Member, Organizing Committee, Conference on Laser Ablation (COLA VIII), Banff, Canada, September, 2005.

Chair, Gordon Conference on Tribology, 2006.

Member, Advisory Committee, Center for Nanophase Materials Sciences, ORNL, 2006-presesnt.

Member, DOE Workshop on Materials under Extreme Conditions; Lead Section on Laser materials Interactions, June, 2007.

Member, Organizing Committee, Conference on Laser Ablation (COLA IX), Tenerife, September, 2007.

Co-Chair, Topical symposium on Non-Linear and Ultra-fast Laser Interactions with Materials at the American Physical Society March Meeting in New Orleans, March, 2008.

Co-Chair, Topical symposium entitled Non-Linear and Ultra-fast Laser Interactions with Materials at the American Physical Society March Meeting in Pittsburgh, March, 2009.

Chair of Tutorial Committee, Conference on Laser Ablation (COLA X), Singapore, September, 2009.

Co-Director: Isola di San Servolo Venezia – Italy, 2nd International School on *Laser-surface interactions for new materials production: tailoring structure and properties*, July, 2010.

Co-Organizer: Conference on Laser Ablation 2011, Playa del Carmen, Mexico, November, 2011

Co-Organizer: OSA Sessions: Light-Matter Interactions and Materials Processing 2012, 2013

Co-Organizer SPIE Conference: Laser Applications in Microelectronic and Optoelectronic Manufacturing, January, 2012, 2013, 2014

Co-Organizer SPIE Conference: Synthesis and Photonics of Nanoscale Material, January, 2012, 2013

Organizing Committee, Isola di San Servolo Venezia – Italy, 2nd International School on *Laser-surface interactions for new materials production: tailoring structure and properties*, July, 2012.

Organizing Committee, International Conference on Laser Ablation (COLA), 2013.

Organizing Committee, International Conference on Photo‐Excited Processes and Applications, October, 2014.

**RESEARCH ACTIVITY AND FUNDING:**

Dr. Dickinson's research has been in the general areas of materials physics, materials chemistry, surface science, and physics education.

Recent research has focused on:

a)                laser modification of surfaces, laser-ablation and laser induced desorption mechanisms in polymers and ceramics, single crystal inorganics;

b)               understanding of tribochemistry in relation to nanoscale wear in solutions and using tribology to control and manipulate recrystallization from solutions; mechanisms of wear and nanometer surface modification.

c) use of photoemission to understand defect production at surfaces due to radiation, mechanical stimulation.

d) transient current measurements due to contact (tribo-currents) and fracto-emission (the emission of particles during fracture and tribological loading of materials) from crystalline materials, ceramics, polymers, and composites.

e) development of Computer based computer tutoring and testing of calculus level beginning physics students.

f) development of e-Learning tools and courseware for a WSU two semester upper division physics course (Electrodynamics) taught in a hybrid format.

Funding for this work has averaged $200K-$400K/year for ~32 years from sources including: NSF, DOE-BES, DOE-EMSP, ONR, AFOSR, NASA, NATO, NIH, Boeing, McDonnell Douglas, Goodyear, Dow, IBM, 3M, Tektronix, Westinghouse-Hanford Co., Granville-Phillips Co., Murdock Charitable Trust, Sandia National Laboratories, Battelle Pacific Northwest Laboratories, Washington Technology Center. Camille and Henry Dreyfus Foundation, Northwest Academic Computing Consortium.

**INVITED TALKS:**

Presented over 360 invited talks at national and international meetings, government and industrial laboratories, and universities in the U.S. Japan, and Europe.

***RECENT INVITED TALKS:***

“Photonic Defect Generation in Wide Bandgap Single Crystals: The Road to Ruin,” Chemistry Department, WSU, January, 2005

“Nanotribology—Rubbing on a Small Scale,” Chemistry and Chemical Engineering, Pennsylvania State University, February, 2005.

“There’s the Rub: Tribochemistry at the nanometer size scale,” 11th International Conference on Fracture,” Turin, Italy, March, 2005.

“Tribochemical Studies at the Nanometer Scale: synergisms of mechanical and chemical forces,“ Plenary Speaker, International Nanotribology Workshop, Porquerolles, France, June, 2005.

“Tribochemical studies at the nanometer scale: synergisms of mechanical and chemical forces,” Goldschmidt Conference, Moscow, ID, June, 2005

“Single Asperity atomic force microscope studies of the Chemical Mechanical Planarization of silicate glasses”, World Tribology Conference, Washington DC, September, 2005.

Invited Lecturer- NATO ADVANCED SCHOOL (ASI) “**PHOTON-BASED NANOSCIENCE & TECHNOLOGY: *From Atomic Level Manipulation to Materials Synthesis & Nanobiodevice Manufacturing”***at Sherbroke Canada (19-29 September 2005)

“The WSU On line Quizzing and Tutoring System,” WSU Colloquium, October, 2005.

"Fundamental studies in Tribochemistry using Atomic Force Microscopy," 2006 International CMP-MIC Conference, Fremont, CA, March, 2006

"Synergisms between mechanical and chemical stimulation of surfaces at the Nanometer Size Scale,", March Meeting of the American Physical Society, March, 2006

"Atomic Scale Tribochemistry," International Conference on Frontiers in Boundary Lubricating Films, Lyon, France, May 2006

"New Directions in UV Laser Interactions with Materials," DOE Workshop on Applications of Lasers to Energy Problems, May, 2006

"Fundamental issues of sub-threshold material removal by laser irradiation", SPIE International Conference on High-Power Laser Ablation, Taos New Mexico, May, 2006

"Synergisms between mechanical and chemical stimulation of surfaces at the Nanometer Size Scale," Los Alamos National Laboratory, May, 2006

“Material removal by laser irradiation from insulating materials,” International Conference on Photo-Excited Processes and Applications, U. Virginia, Charlottsville, Virginia, September 2006

“Fast lasers and short wavelengths: implications for laser processing of materials,” The International Conference on Advanced Laser Technologies, Brasov, Romania, Sept. 2006.

“The One-Two Punch: Synergisms arising from combined mechanical and chemical stimuli at the nanometer size scale,” 5th European Science Foundation Invited Workshop on Nanotribology, Antalya, Turkey, Sept. 2006.

“Experiments with ultrashort pulses at ultrashort wavelengths,” Paul Scherrer Institut, Villingen, Switzerland, Sept. 2006

"Synergisms between mechanical and chemical stimulation of surfaces at the Nanometer Size Scale," Dept. of Materials Science, University of Tennessee, October, 2006

“Advances in laser desorption from wide bandgap materials,” Materials Science Division, Oak Ridge National Laboratory, October, 2006.

“The One-Two Punch: Synergisms arising from combined mechanical and chemical stimuli at the nanometer size scale,” Keynote Address in New Breakthroughs in Nanotechnology Series, Oak Ridge National Laboratory, October, 2006.

“The One-Two Punch: Synergisms arising from combined mechanical and chemical stimuli at the nanometer size scale,” Chemical Engineering Dept., Washington State University, October. 2006.

Synergisms arising from combined mechanical and chemical stimuli at the nanometer size scale,” Chemical Engineering Dept., ASTM International Annual Meeting, Orlando, FL, December, 2006.

 “Fast lasers and short wavelengths: implications for laser processing of materials,” University of Michigan, Dept. of Materials Science, December, 2006.

“Synergisms arising from combined radiative and chemical stimuli at the nanometer size scale,” The William L. Williams Distinguished Lecture in Physics, University of Michigan, December, 2006.

“The One-Two Punch: Consequences of Combining Stimuli to Materials – Mechanical and Chemical,” Dept. of Physics, University of Michigan, December, 2006.

 “The WSU Online Question and Tutoring System (WSU Q&T): A tool for teaching Science and Mathematics,” School of LS&A, University of Michigan, December, 2006.

“The One-Two Punch: Consequences of Combining Mechanical and Chemical Stimuli to Materials” School of Mechanical and Materials Engineering, Washington State University, January, 2007.

“Laser Interactions with Wide Bandgap Materials,” WSU Dept. of Physics and Astronomy, January, 2007.

 “Consequences of Combining Stimuli to Materials – Mechanical and Chemical: How does one polish single crystal Si?,” Chemical Sciences, ORNL, March, 2007

“Synergisms arising from combined mechanical and chemical stimuli at the nanometer size scale,” Nanotechnology Center, Vanderbilt Unversity, March, 2007.

 “Fast lasers and short wavelengths: implications for laser processing of materials,” University of Michigan, Dept. of Physics, Vanderbilt University, March, 2007.

"Synergisms between mechanical and chemical stimulation of surfaces at the Nanometer Size Scale,", Spring Meeting of the Materials Research Society, San Francisco, CA, April, 2007.

New studies of Nano-Tribo-Chemical modification of surfaces,” 6th European Science Foundation Invited Workshop on Nanotribology, Santa Margherita di Pula, Sardinia, Italy, May, 2007.

“Laser induced Particle Emission from Wide bandgap Materials”, Dept. Physics, University of Idaho, October, 2007

“A New Look at Laser Interactions with Wide Bandgap Materials,” SPIE-International Society for Optical Engineering Photonics West, San Jose, CA January, 2008

"Kissing surfaces with hard UV photons: the consequences of photo-dissociation of near-surface molecular bonds in solids," 3rd Pacific International Conference on Applications of Lasers and Optics, Beijing, China, April, 2008

"Laser desorption at the threshold for plasma formation" SPIE- International Society for Optical Engineering High-Power Laser Ablation Conference, VII, Taos, NM, April 2008.

“Laser modification of surfaces,” Department of Energy Workshop on High Sensitivity Methods of Materials Analysis, Annapolis, Maryland, May, 2008.

“Vacuum UV laser interactions with wide bandgap materials,” Pacific Northwest National Laboratory, July, 2008.

The One Two Punch: Lasers + chemical stimulation of surfaces," Workshop on Extreme Excitation Processing of in Materials U. Nebraska, August, 2008

“Curiosity – the key to discovery”, Plenary Speaker to College of Pharmacy “Exploring Health Careers” (~40 minority student work shop). August, 2008

“The use of nanometer scale stresses to modify surfaces”, WSU Physics Colloquium, September, 2008.

"Fundamental issues concerning material removal by laser irradiation from insulating materials", the opening keynote address at the 6th International Conference on Photo-Excited Processes and Applications (ICPEPA 2008), Sapporo, Japan, September 2008.

"Lasers as directed energy sources: capabilities and applications in agriculture", Biological Systems Engineering Colloquium, WSU, October, 2008.

“How Lasers can modify materials in useful ways,” Workshop on Industrial Applications of Lasers, ESI Corporation, Portland Oregon, November, 2008.

“Incoming! Incoming! (Laser Beam): Fundamentals of Laser Materials Interactions,” WSU Physics Colloquium, September, 2009

"Fundamental studies of UV laser interactions with single crystal ZnO, 10th International Conference on Laser Ablation, Singapore, November, 2009.

"Investigation of laser surface modification of solids: Mechanisms, Opening Tutorial Lecture at the 10th International Conference on Laser Ablation, Singapore, November, 2009.

 “A new look a the production of excited states created by laser irradiation of surfaces,”, Workshop on Extreme Excitation Processing of in Materials U. Nebraska, March, 2010

"Laser desorption below the threshold for plasma formation" International Society for Optical Engineering High-Power Laser Ablation Conference, VIII, Taos, NM, April 2010.

“Laser modification of surfaces,” Department of Energy Workshop on High Sensitivity Methods of Materials Analysis, Baltimore, Maryland, May, 2010.

“Important issues in laser materials interactions and relevant applications,” 3 Lectures at the Venice School on Laser Interactions with Materials, July 2010.

"The Enormous Little World of Nanotechnology", Plenary Speaker at Nanotechnology for Tomorrow, at U. Wisconsin-Whitewater, October, 2010.

"The Enormous Little World of Nanotechnology", Washington State University-Tri-Cities, November, 2010.

"Laser interactions with single crystal ZnO, Pacific Northwest National Laboratory, November, 2010.

"Fundamental Studies of Excimer laser interactions with single crystal ZnO, SPIE-LASE 2011, San Francisco, January 2011.

"Fundamental Studies of Excimer laser interactions with single crystal ZnO, U. Idaho Physics Department, February, 2011.

"The Enormous Little World of Nanotechnology", Washington State University-Vancouver, Jan., 2012.

"Fundamental Studies of Excimer laser interactions with single crystal ZnO", International Conference on Photo-Excited Processes and Applications (ICEPA-8), Rochester, NY, August, 2012.

“The one two punch: examples of synergisms at surface of solids”, DARPA Workshop on Novel Methods of Processing Materials, Breckenridge, CO, January, 2013.

***CONTRIBUTED PRESENTATIONS:***

Over 420 contributed papers presented, including 2-5 talks a year each at APS March Meeting, American Vacuum Society, The International Society for Optical Engineering (SPIE), American Ceramics Society, MRS Fall or Spring Meetings, and ACS National Meetings.

**PUBLICATIONS:**

**(All are peer reviewed except those marked with \*)**

1. J. C. Zorn, T. C. English, J. T. Dickinson, and D. A. Stephenson, "Molecular Beam Measurement of the Hyperfine Structure of RbF," J. Chem. Phys. 45, 3731 (1966).

2. J. C. Zorn, D. A. Stephenson, J. T. Dickinson, and T. C. English, "Triple Resonance Method for Molecular hfs Spectroscopy: Measurements in CsF," J. Chem. Phys. 47, 3904 (1967).

3. R. H. Hammerle, J. T. Dickinson, R. G. VanAusdal, D. A. Stephenson, and J. C. Zorn, "The Hyperfine Structure of Thallium Chloride," J. Chem. Phys. 50, 2086 (1969).

4. J. T. Dickinson, D. A. Stephenson, and J. C. Zorn, "Hyperfine Structure of Thallium Chloride," J. Chem. Phys. 50, 2086 (1969).

5. D. A. Stephenson, J. T. Dickinson, and J. C. Zorn, "The Hyperfine Structure of Thallium Iodide and an Upper Limit for the Electric Hexadecapole Moment of the Iodine Nucleus," J. Chem. Phys. 53, 1529 (1970).

6. J. T. Dickinson, James M. J. M. Lockhart, and J. C. Zorn, "Use of a Metastable Atom Probe for the Study of Electron Dynamics," Am. J. Phys. 39, 993 (1971).

7. J. T. Dickinson, "The Falling Meter Stick," Physics Teacher 9, 336 (1971).

8. J. T. Dickinson, "Rolling Spool Experiment," Physics Teacher 10, 210 (1972).

9. J. T. Dickinson, "'Millergrams' in the Lab," Physics Teacher 10, 39 (1972).

10. J. T. Dickinson, "Experiments in Physics 201-202," Washington State University (1971); Revised approximately every two years.

11. J. H. Craig, Jr. and J. T. Dickinson, "Versatile System for the Study of Molecular Beam Scattering," J. Vac. Sci. Technol. 10, 403 (1973).

12. J. H. Craig, Jr. and J. T. Dickinson, "Scattering of Metastable Molecules from a Gas-Covered (100) Surface of Germanium," J. Vac. Sci. Technol. 10, 319 (1973).

13. J. T. Dickinson, "Voltage Follower for RC Circuit Experiment," Am. J. Phys. 41, 745 (1973).

14. J. T. Dickinson, "Transportation and Energy Conservation in the Pacific Northwest," Pacific Northwest Science 48, 145 (1974).

\*15. L. W. Swanson, J. T. Dickinson, and D. R. McNeely, "Fabrication and Surface Characterization of Composite Refractory Compounds Suitable for Thermionic Converters," NASA Report No. CR-2668 (1975).

\*16. J. T. Dickinson, "Energy Conservation in Transportation," Proceedings of WSU Thermal Power Conference (1975).

17. L. W. Swanson and J. T. Dickinson, "Single Crystal Work Function and Evaporation Measurements of LaB6," Appl. Phys. Lett. 28, 578 (1976).

\*18. L. W. Swanson, N. Eror, and J. T. Dickinson, "Impregnated Cathode Studies," Tektronix Corp. Report (July 1975).

19. J. T. Dickinson, "Liquid Nitrogen in a Balloon," Physics Teacher 15, 361 (1977).

20. J. T. Dickinson and R. J. Madix, "The Mechanism of Methanol Formation and Other Reactions Following Formaldehyde Adsorption on Ni(110), Internat, J. Chem. Kinetics 10, 871 (1978).

21. J. T. Dickinson, H. Poppa, and G. M. Pound, "Chemisorption of CO on Well-Characterized Supported Pd Particles, J. Vac. Sci. Tech. 15, 568 (1978).

22. L. R. Danielson, M. J. Dresser, E. E. Donaldson, and J. T. Dickinson, "Adsorption and Desorption of Ammonia, Hydrogen, and Nitrogen on Ruthenium (0001), Surf. Sci. 71, 599 (1978).

23. J. T. Dickinson, P. Braunlich, L. Larson, and A. Marceau, "Characteristic Emission of Negatively Charged Particles During Tensile Deformation of Oxide-Covered Aluminum Alloys," Appl. Surf. Sci. 1, 515-537 (1978).

24. J. T. Dickinson, "Comments on Physics and Society at Washington State University," Am. J. Phys. 47, 745 (1979).

25. L. Larson and J. T. Dickinson, "The Decomposition of Formic Acid on Ru(1010)," Surf. Sci. 84, 17 (1979).

26. L. A. Larson, J. T. Dickinson, P. Braunlich, and D. Snyder, "The Emission of Neutral Particles from Anodized Aluminum Surfaces During Tensile Deformation," J. Vac. Sci. and Tech. 16, 590 (1979).

27. D. L. Doering, T. Oda, J. T. Dickinson, and P. Braunlich, "Characterization of Anodic Oxide Coatings on Aluminum by Tribostimulated Exoemission," Appl. Surf. Sci. 3, 196 (1979).

28. L. A. Larson, P. Braunlich, and J. T. Dickinson, "On the Surface Compositions and Color Center Processes Corresponding to Thermally-Stimulated Exoemission from NaCl," Solid State Communications 32, 347 (1979).

\*29. J. T. Dickinson and P. Braunlich, "Tribostimulated Emission of Electrons and Neutral Particles from Anodized Aluminum," Proceedings of the ARPA/AFOSR Conference on NDA, La Jolla, CA (1979).

30. J. T. Dickinson, D. B. Snyder, and E. E. Donaldson, "Acoustic Emission and Electron Emission During Deformation of Anodized Aluminum," J. Vac. Sci. Tech. 17, 429 (1980).

31. D. L. Doering, H. Poppa, and J. T. Dickinson, "Changes Induced on the Surfaces of Small Pd Clusters by the Thermal Desorption of CO," J. Vac. Sci. Tech. 17, 198 (1980).

32. J. T. Dickinson and P. Braunlich, "Exoemission During Oxide Coating Fracture," Proceedings of the International Symposium on Exoemission and Applications, Rostock, E. Germany (October 1979).

33. P. Braunlich and J. T. Dickinson, "Thermostimulated Processes at Surfaces of Solids," Proceedings of the VI International Symposium on Exoemission and Applications, Rostock, E. Germany (October 1979).

34. J. T. Dickinson, D. B. Snyder, and E. E. Donaldson, "Electron and Acoustic Emission Accompanying Oxide Coating Fracture," Thin Solid films 72, 223 (1980).

35. D. L. Doering, H. Poppa, and J. T. Dickinson, "The Effect of Particle Size on the Chemisorption and Disproportionation of CO on Pd and Ni Clusters," J. Vac. Sci. Tech. 18, 238 (1981).

36. J. T. Dickinson, E. E. Donaldson, and D. B. Snyder, "Emission of Electrons and Positive Ions Upon Fracture of Oxide Films," J. Vac. Sci. Tech. 18, 460 (1981).

37. J. T. Dickinson, E. E. Donaldson, and M. K. Park, "The Emission of Electrons and Positive Ions from Fracture of Materials," J. Mater. Sci. 16, 2897 (1981).

38. D. L. Doering, J. T. Dickinson, and H. Poppa, "UHV Studies of the Interaction of CO with Small Supported Metal Particles I: Ni/Mica," J. Catalysis 73, 91 (1982).

39. D. L. Doering, J. T. Dickinson, and H. Poppa, "UHV Studies of the Interaction of CO with Small Supported Metal Particles II: Pd/Mica," J. Catalysis 73, 104 (1982).

40. J. T. Dickinson, M. K. Park, E. E. Donaldson, and L. C. Jensen, "Fracto-Emission Accompanying Adhesive Failure," J. Vac. Sci. Technol. 20, 436 (1982).

\*41. J. T. Dickinson, "Fracto-Emission from Composites," Proceedings of a Critical Review: Characterization of Composites, M.I.T., June 8-10, 1981, Office of Naval Research, Boston, MA.

42. D. L. Doering, H. Poppa, and J. T. Dickinson, "Chemisorption of CO on Particulate Deposits of Pd," J. Vac. Sci. and Tech. 20, 827 (1982).

43. J. T. Dickinson and L. C. Jensen, "Crack Velocity Dependence of Electron Emission During Fracture in Filled Elastomers," J. Polymer Sci., Polymer Phys. Ed. 20, 1925 (1982).

44. J. T. Dickinson, L. C. Jensen, and M. K. Park, "Time Correlations of Electron and Positive Ion Emission Accompanying and Following Fracture of a Filled Elastomer," Appl. Phys. Lett. 41, 443 (1982).

45. J. T. Dickinson, L. C. Jensen, and M. K. Park, "Time-of-Flight Measurements of the Mass-to-Charge Ratio of Positive Ion Emission Accompanying Fracture," J. Mater. Sci. 17, 3173 (1982).

46. M. H. Miles and J. T. Dickinson, "Fracto-Emission from PETN and HMX Single Crystals," Appl. Phys. Lett. 41, 924 (1982).

47. J. T. Dickinson, L. C. Jensen, and M. K. Park, "Mass-to-Charge Ratio and Kinetic Energy of Positive Ion Emission Accompanying Fracture of a Filled Elastomer," Appl. Phys. Letts. 41, 827 (1982).

48. J. T. Dickinson and L. C. Jensen, "Correlations in Time of Electron and Positive Ion Emission Accompanying Fracture," J. Vac. Sci. Technol. A1, 1160 (1983).

49. J. T. Dickinson, L. C. Jensen, and A. Jahan-Latibari, "Fracto-Emission from Filled and Unfilled Elastomers," (Review Article), Rubber Chem. and Tech. 56, 927 (1984).

50. J. T. Dickinson, L. C. Jensen, and A. Jahan-Latibari, "Fracto-Emission: The Role of Charge Separation," J. Vac. Sci. Technol. A2, 1112 (1984).

51. J. T. Dickinson, L. B. Brix, and L. C. Jensen, "Electron and Positive Ion Emission Accompanying Fracture of Wint-O-Green Lifesavers and Single Crystal Sucrose," J. Phys. Chem. 88, 1698 (1984).

52. M. Loudiana, A. Schmid, and J. T. Dickinson, "Degradation of Dielectric Films By XeF Excimer Intermediates," Proceedings of Symposium on Laser Induced Damage in Optical Materials, NBS Publications, (1984).

53. J. T. Dickinson, L. C. Jensen, and A. Jahan-Latibari, "The Effect of Cross-Linking on Fracto-Emission from Elastomers," J. Mat Sci. 19, 1510 (1984).

54. J. T. Dickinson, Response to: "On the Question of Emission of Charged Particles in the Case of Failure of Solids," Mater. Sci. Lett. 19, 2426 (1984).

55. J. T. Dickinson, M. H. Miles, W. L. Elban, and R. G. Rosemeier, "Fracto-Emission from RDX Single Crystals," J. Appl. Phys. 55, 3994 (1984).

56. J. T. Dickinson, Fracto-Emission Accompanying Adhesive Failure," in Adhesive Chemistry--Developments and Trends, ed. by L. H. Lee (Plenum Publishers, New York), Review Article, 1984.

57. M. L. Klakken, J. T. Dickinson, and L. C. Jensen, "Electrical Breakdown Induced by Fracture," IEEE Transactions on Electrical Insulation, EI-19, 578 (1984).

58. J. T. Dickinson, A. Jahan-Latibari, and L. C. Jensen, "Fracto-Emission from Single Fibers of Kevlar-49," J. Mater. Sci. 20, 1835 (1985).

59. J. T. Dickinson, A. Jahan-Latibari, and L. C. Jensen, "Electron Emission and Acoustic Emission from the Fracture of Graphite/Epoxy Composites," J. Mater. Sci. 20, 229 (1985).

60. J. T. Dickinson, L. C. Jensen, and S. Bhattacharya "Fracto-Emission from the Failure of Metal/Epoxy Interfaces," J. Vac. Sci. Technol. A3, 1398 (1985).

61. M. A. Loudiana, A. S. Schmid, J. T. Dickinson, and E. J. Ashley, "The Role of Adsorbed Fluorine in the Chemical Sputtering of Silica," Surf. Sci. 141, 409 (1984).

62. J. T. Dickinson, W. D. Williams, and L. C. Jensen, "Fracto-Emission from Lead Zirconate-Titanate," J. Am. Ceram. Soc., 68 235 (1985).

63. J. T. Dickinson, X. A. Shen, and L. C. Jensen, "Peeling of Pressure Sensitive Adhesives," Proceedings of the 30th National SAMPE Symposium, 1985.

64. E. E. Donaldson, X. A. Shen, and J. T. Dickinson, "Photon and Radiowave Emission from Peeling Pressure Sensitive Adhesives in Air," Proceedings of the 30th National SAMPE Symposium, 1985.

65. M. H. Miles, J. T. Dickinson, and L. C. Jensen, "Fracto-Emission from Single Crystals of PETN," J. Appl. Phys. 57, 5048 (1985).

66. J. T. Dickinson, A. Jahan-Latibari, and L. C. Jensen, "Fracto-Emission from Fiber-Reinforced and Particulate Filled Composites," in Polymer Composites and Interfaces, ed. by N. G. Kumar and H. Ishida (Plenum Publishers, New York), Review Article, 1985.

67. M. A. Loudiana, J. T. Dickinson, and E. J. Ashley, "Electron-Induced Damage of ThF4 Thin Films in the Presence of XeF2, J. Vac. Sci. Technol. A3, 647 (1985).

68. W. Durrer, H. Poppa, and J. T. Dickinson, "Decomposition of Ethylene on Small Pd Particles," J. Vac. Sci. Technol. A3, 1545 (1985).

69. J. T. Dickinson and L. C. Jensen, "Fracto-Emission from Filled and Unfilled Polybutadiene," J. Poly. Sci.: Poly. Phys. Edition 23, 873 (1985).

70. M. A. Loudiana, J. Bye, J. T. Dickinson, and D. A. Dickinson, "Chemisorptive Emission from Fluorine Adsorption on Tungsten," Surf. Sci. 157, 459 (1985).

71. J. T. Dickinson, M. J. Dresser, and L. C. Jensen, "Time Correlation of Ion and Electron Emission from Surfaces Following Fracture," in Desorption Induced by Electronic Transitions (DIET II), W. Brenig and D. Menzel, ed., Springer-Verlag, Berlin, (1985).

72. L. A. K'Singam, J. T. Dickinson, and L. C. Jensen, "Electron and Photon Emission Accompanying Failure of Metal/Glass Interfaces," J. Am. Ceramics Soc. 68, 510 (1985).

73. J. T. Dickinson, M. L. Klakken, M. H. Miles, and L. C. Jensen, "Electron Beam Induced Fracture of Polymers," J. Poly. Sci.: Poly. Phys. Ed. 23, 873 (1985).

74. Ch. Park, W. G. Durrer, H. Poppa, and J. T. Dickinson, "CO Desorption from Supported Ru Particles," J. Catalysis 95, 361 (1985).

75. M. A. Loudiana and J. T. Dickinson, "Simultaneous Exposure of SiO2 and ThF4 to XeF2 and Energetic Electrons," J. Vac. Sci. Technol. B3, 1393 (1985).

76. E. E. Donaldson, J. T. Dickinson, and X. A. Shen, "Time and Size Correlations of Photon and Radiowave Bursts from Peeling Pressure Sensitive Adhesives in Air," J. Adhesion 19, 267 (1986).

77. J. T. Dickinson, L. C. Jensen, and M. R. McKay, and F. Freund, "Emission of Atoms and Molecules Due To Fracture of Single Crystal MgO," J. Vac. Sci. Technol. A 4, 1648 (1986).

78. J. T. Dickinson, L. C. Jensen, and M. L. Klakken, "Electron Beam Induced Fracture of Kevlar Single Fibers," J. Vac. Sci. Technol. A 4, 1501 (1986).

\*79. E. E. Donaldson and J. T. Dickinson, "Autographs of Adhesive Failure: Direct Recording of Photon Emission on Photographic Film," Proceedings of the 31st International Symposium, SAMPE (1986).

80. J. T. Dickinson, L. C. Jensen, and M. R. McKay, "Neutral Molecule Emission from the Fracture of Crystalline MgO," J. Vac. Sci. Technol. A, 5, 1162 (1987).

81. J. T. Dickinson, K. Tonyali, M. L. Klakken, and L. C. Jensen, "Crack Initiation and Crack Growth in Polymers Induced by Electron Bombardment," J. Vac. Sci. Technol. A, 5, 1076 (1987).

\*82. J. T. Dickinson, M. L. Klakken, and L. C. Jensen, "Bombardment Induced Crack Initiation and Crack Growth in Polymers," Proceedings of the 18th International Technical Conference, SAMPE, October, 1986, pp 983-992.

\*83. J. T. Dickinson, L. C. Jensen, and W. D. Williams, "Fracto-Emission Accompanying the Deformation and Failure of Composites and Adhesive Joints," Proceedings of the 18th International Technical Conference, SAMPE, October, 1986, pp 390-400.

84. A. S. Crasto, R. Corey, J. T. Dickinson, R. V. Subramanian, and Y. Eckstein, "Correlation of Photon and Acoustic Emission with Failure Events in Model Composites," Composites Sci. & Technol., 30, 35 (1987).

85. R. Michael, S. Frank, D. Stulik, and J. T. Dickinson, "Changes in Surface Morphology and Microcrack Initiation in Polymers under Simultaneous Exposure to Stress and Fast Atom Bombardment," in *Influence of Radiation on Material Properties Part II*, ASTM Special Technical Publication STP 956, F. A. Garner, C. H. Henager, and N. Igata, editors, (American Society for Testing and Materials, Philadelphia, 1987), pp. 682-687.

86. J. T. Dickinson, L. C. Jensen, and S. Bhattacharya, "Fracto-emission from Neat Epoxy Resin" (review article), in *Die Makromolekulare Chemie: Macromolecular Symposia* 7 129 (1987).

87. M. A. Loudiana, J. T. Dickinson, A. Schmid, and E. J. Ashley, "Electron Enhanced Sorption of Fluorine by Silver Surfaces," Appl. Surf. Sci. 28 311 (1987).

88. S. C. Langford, J. T. Dickinson, and L. C. Jensen, "Simultaneous Measurements of the Electron and Photon Emission Accompanying Fracture of Single Crystal MgO," J. Appl. Phys. 62, 1437 (1987).

89. J. T. Dickinson and L. C. Jensen, "Fracto-Emission from Polymers, Crystals, and Interfaces," Proceedings of The International Society for Optical Engineering (SPIE): Fluorescence Detection I 743, 68 (1987).

90. M. Guardalben, A. Schmid, M. Loudiana, and J. T. Dickinson, "Photothermal Analysis of Synergistic Radiation Effects in ThF4 Optical Thin Films," Phys. Rev. B, 35 4026 (1987).

91. J. T. Dickinson and E. E. Donaldson, "Autographs from Peeling Pressure Sensitive Adhesives: Direct Recording of Fracture Induced Photon Emission," J. Adhesion, 24, 199 (1987).

\*92. J. T. Dickinson and M. A. Loudiana, "Radiation Induced Damage of Optical Coatings,” Proceedings of the ACS Division of Polymeric Materials: Science and Engineering 56, 680 (1987).

\*93. J. T. Dickinson, "Fracto-Emission Accompanying the Deformation and Failure of Crosslinked Polymers and Interfaces,” Proceedings of the ACS Division of Polymeric Materials: Science and Engineering 56, 264 (1987).

\*94. J. T. Dickinson, "Bombardment Induced Crack Initiation and Crack Growth in Polymers and Polymer Surfaces,” Proceedings of the ACS Division of Polymeric Materials: Science and Engineering 56, 282 (1987).

95. J. T. Dickinson, L. C. Jensen, M. H. Miles, and R. Yee, "Fracto-Emission Accompanying Adhesive Failure Between Rocket Propellent Constituents," J. Appl. Phys. 62, 2965 (1987).

96. J. T. Dickinson, "Surface Interactions Relevant to Space Station Contamination Problems," in *A Study of Space Station Contamination Effects,* M. R. Torr, et al. editors, NASA Conference Publication 3002, (National Aeronautics and Space Agency, 1988), pp. 109-121.

97. Ma Zhenyi, Fan Jiawen, and J. T. Dickinson, "Properties of the Photon Emission Accompanying the Peeling of a Pressure Sensitive Adhesive," J. Adhesion 25, 63 (1988).

98. E. E. Donaldson, J. T. Dickinson, and S. K. Bhattacharya, "Production and Properties of Ejecta Produced by Fracture of Materials,” J. Adhesion 25 281 (1988).

99. S. C. Langford, D. L. Doering, and J. T. Dickinson, "The Production of Free Charge Carriers by Fracture of Single Crystal Silicon,” Phys. Rev. Lett. 59, 2795 (1987).

100. K. Tonyali, L. C. Jensen, and J. T. Dickinson, "The Interaction of Excimer Laser Ultraviolet Radiation with Kapton-H Under Mechanical Stress," J. Vac. Sci. Technol. A 6, 941 (1988).

101. J. T. Dickinson, S. C. Langford, L. C. Jensen, J. Kelso, C. Pantano, and G. McVay, "Fracto-Emission from Fused Silica and Sodium Silicate Glasses," J. Vac. Sci. and Technol. A 6, 1084 (1988).

102. K. C. Yoo, R. G. Rosemier, J. T. Dickinson, and S. C. Langford, "Anisotropy Effects in Fracto-Emission from MgF2 Single Crystals,” Appl. Phys. Lett. 55, 354 (1989).

103. J. P. Mathison, S. C. Langford, and J. T. Dickinson, "Concerning the Post Emission of Electrons from Cleavage Surfaces of Single Crystal LiF," J. Appl. Phys. 65 1923 (1989).

104. S. C. Langford, J. T. Dickinson, and L. C. Jensen and L. R. Pederson, "Positive Ion Emission from the Fracture of Fused Silica," J. Vac. Sci. Technol. A. 7, 1829 (1989).

105. E. E. Donaldson, M. H. Miles, and J. T. Dickinson, "Electrical Charge Measurements on Ejecta from Impact Loading of Explosive Crystals," J. Mater. Sci. 24, 4453 (1989).

106. P. A. Eschbach, J. T. Dickinson, S. C. Langford, and L. R. Pederson, "The Interaction of UV Excimer Laser Light with Sodium Trisilicate, " J. Vac. Sci. Technol. A 7, 2943 (1989).

107. E. E. Donaldson and J. T. Dickinson, "Autographs from Peeling Fiber Reinforced Pressure Sensitive Adhesives: Correlation with Failure Mechanisms,"J. Adhesion 30, 13 (1989).

108. J. T. Dickinson, P. A. Eschbach, and L. R. Pederson, "Characterization of Emitted Particles from Excimer Laser Bombardment of Glass," Materials Research Society Symposium Proceedings 129, *Laser and Particle-Beam Chemical Processes on Surfaces*, A. W. Johnson, G. L. Loper, and T. W. Sigmon, ed., pp. 385-392 (1989).

109. J. T. Dickinson and A. S. Crasto, "Fracto-Emission Accompanying the Deformation and Failure of Crosslinked Polymers and Interfaces,” in *Cross-linked Polymers: Chemistry, Properties and Applications*, R. A. Dickie, S. S. Labana, and R. S. Bauer, editors, ACS Symposium Series 367 (American Chemical Society, Washington, D.C. 1988), pp. 145-168.

110. J. T. Dickinson, M. A. Loudiana, and A. Schmid, "Consequences of Exposure of Optical Coatings to Reactive Gases and Energetic Particles," (Review Article) in *Adhesion, Sealants and Coatings for Space and Health Environments*, L. H. Lee, ed.,Plenum Press, New York, 1988, pp. 467-475.

\*111. J. T. Dickinson and L. C. Jensen, "Fracto-Emission from Polymers, Interfaces, and Single Crystals,,” *ASM Proceedings for 13th International Symposium for Testing and Failure Analysis,* Los Angeles, November, 1987).

112 J. T. Dickinson, D. L. Doering, and S. C. Langford, "Electron Emission and Free Charge Carrier Production Due to Fracture of Single Crystal Silicon," in *Atomic and Molecular Processing of Electronic and Ceramic Materials: Preparation, Characterization, and Properties*, I. H. Aksay, et. al. editors, (Materials Research Society, Pittsburgh, 1988), pp. 39-46.

113. K. Tonyali, L. C. Jensen, and J. T. Dickinson, "Excimer Laser Induced Damage in Stressed Polyimide Films," MRS Symposium Proceedings, Vol. 100: *Fundamentals of Beam-Solid Interactions and Transient Thermal Processing*, M. J. Aziz, et. al. editors, (Materials Research Society, Pittsburgh, 1988), pp. 665-670.

114. J. T. Dickinson, "Bombardment Induced Crack Initiation and Crack Growth in Polymers and Polymer Surfaces," (Review Article) in *Adhesion, Sealants and Coatings for Space and Health Environments,* L. H. Lee, editor, Plenum Press, New York, 1988, pp. 97-109.

115. R. Y. Yee, J. T. Dickinson, L. C. Jensen, and M. H. Miles, "Charge Emissions Accompanying Solid-Binder Interfacial Separation," *Proceedings of the JANNAF Workshop on Rocket Propellent Ignition*, 1988.

116. J. T. Dickinson, "Photon Emission from Peeling Pressure Sensitive Adhesives, *SPIE Vol. 910 Fluorescence Detection II*, R. Menzel, ed., 1988, pp. 13-18.

117. J. T. Dickinson and L. C. Jensen, "Radiation Induced Crack Initiation and Crack Growth in Polymers, " *Proceedings of the 9th International Symposium on Exoelectron Emission and Applications*," Wroclaw, Poland, 1988.

118. W. G. Durrer, H. Poppa, and J. T. Dickinson, "The Decomposition of Unsaturated Hydrocarbons on Small Pd Particles," J. Catalysis 115, 310 (1989).

119. S. C. Langford and J. T. Dickinson, "The Emission of Particles and Photons from the Fracture of Minerals and Inorganic Materials," (invited review) in *Spectroscopic Characterization of Minerals and Their Surfaces,* L. M. Coyne, S. W. McKeever, and D. F. Blake eds., ACS Symposium Series Publication 415, pp. 224-244, (1990).

120. J. T. Dickinson, "Fracto-Emission from Adhesive Failure," Invited Review, in *Adhesive Bonding*, L. H. Lee, ed., (Plenum Press, New York, 1991), pp. 395-423.

121. S. C. Langford, Ma Zhenyi, and J. T. Dickinson, "Photon Emission as a Probe of Chaotic Processes Accompanying Fracture,” J. Mater. Res. 4, 1272 (1989).

122. J. T. Dickinson, "Fracto-Emission from Interfacial Failure,” (invited review paper) Materials Research Society Symposium Proceedings 153, *Interfaces Between Polymers, Metals, and Ceramics*, B. M. DeKoven, A. J. Gellman, and R. Rosenberg eds., pp. 331-344, (1989).

123. J. T. Dickinson, L. C. Jensen, S. C. Langford, R. R. Ryan, and E. Garcia, "Fracto-Emission from Deuterated Ti: Supporting Evidence for a Fracto-Fusion Mechanism," J. Mater. Res. 5, 109 (1990).

124. D. L. Doering, S. C. Langford, J. T. Dickinson, and P. Xiong-Skiba, "Fracto-Emission during the Interfacial Failure of a Metal-Oxide-Semiconductor System: Au-SiO2-Si," J. Vac. Sci. Technol. A. 8, 2401 (1990).

125. E. E. Donaldson, J. T. Dickinson, and Naiqiang Wu, "Fracto-Emission Induced Electrical Breakdown in Vacuum," Transactions IEEE Elec. Insul. 25, 549 (1990).

126. S. C. Langford, L. C. Jensen, Ma Zhenyi, and J. T. Dickinson, "Scanning Tunneling Microscopy Analysis of MgO Fracture Surfaces, J. Vac. Sci. Technol. A 8, 3470 (1990).

127. J. T. Dickinson, L. C. Jensen, D. L. Doering, and R. Yee, "Mass Spectroscopy Study of Products from Exposure of RDX Single Crystals to KrF Excimer Laser Radiation," J. Appl. Phys. 67, 3641 (1990).

128. J. T. Dickinson, "Fracto-Emission,” (invited review), Chap. 10 in *Non-Destructive Testing of Fibre-Reinforced Plastic Composites -* II*,* J. Summerscales, ed. Elsevier Applied Science, London (1990), pp. 429-482.

129. J. T. Dickinson, S. C. Langford, L. C. Jensen, P. A. Eschbach, L. R. Pederson and D. R. Baer, "Consequences of Simultaneous Exposure of Inorganic Solids to Excimer Laser Light and an Electron Beam," J. Appl. Phys. 68, 1831 (1990).

130. P. A. Eschbach, J. T. Dickinson, S. C. Langford, L. C. Jensen, L. R. Pederson and D. R. Baer, "Precursors to the Photo-Ablation of Sodium Trisilicate Glass due to UV Excimer Irradiation,” Mater. Res. Soc. Symp. Proc. 158, (1990), pp. 463-469.

131. S. C. Langford, L. C. Jensen, J. T. Dickinson, and L. R. Pederson, "Negative Charge Emission due to Excimer Laser Bombardment of Sodium Trisilicate glass," J. Appl. Phys. 68, 4253 (1990).

132. Ma Zhenyi, S. C. Langford, and J. T. Dickinson, M. H. Engelhard and D. R. Baer, "Fractal Character of Crack Propagation in Epoxy and Epoxy Composites as Revealed by Photon Emission during Fracture," J. Mater. Res. 6, 183 (1991).

133. J. T. Dickinson and Ma Zhenyi, "Fracto-Emission Accompanying Adhesive Failure in A Model Fiber Pull-out System," Die Makromoleculare Chemie, Macromolecular Symposia 41, 9 (1991).

134. J. T. Dickinson, L. C. Jensen, S. C. Langford, and J. P. Hirth, "Atomic and Molecular Emission Following Fracture of Alkali Halides: A Dislocation Driven Process," J. Mater. Res. 6, 112 (1991).

135. S. C. Langford, L. C. Jensen, J. T. Dickinson, and L. R. Pederson, "Alkali Emission Accompanying Fracture of Sodium Silicate Glasses," J. Mater. Res. 6, 112 (1991).

136. J. T. Dickinson, S. C. Langford, L. C. Jensen, "Atomic and Molecular Emission Accompanying Fracture of Single Crystal Ge: A Dislocation Driven Process," Phys. Rev. Lett. 66, 2120 (1991).

137. Ma Zhen-Yi and J. T. Dickinson, "Fracto-Emission from Embedded Interfaces," J. Appl. Phys. 70, 4797 (1991).

138. K. A. Zimmermann, S. C. Langford, and J. T. Dickinson, "Electrical Transients during Interfacial Debonding and Pullout of a Metal Rod from an Epoxy Matrix," J. Appl. Phys. 70, 4808 (1991).

139. J. T. Dickinson, L. C. Jensen, S. C. Langford, P. E. Rosenberg, and D. L. Blanchard, "CO2 Emission Accompanying the Fracture of Calcite," Phys. Chem. Minerals 18(5), 320-325 (1991).

140. Y. Watanabe, J. T. Dickinson, D. M. Kulawansa, and S. C. Langford, “Observations of Fracture Surfaces in Metallic Glasses by SEM and STM,” Memoirs of the Japanese Defense Academy, 31(2) pp. 53-59, (1992).

141. D. M. Kulawansa, S. C. Langford, and J. T. Dickinson, “Scanning tunneling microscope observations of polymer fracture surfaces,” J. Mat. Research, 7(5) 1292-1302 (1992).

142. J. T. Dickinson, L. C. Jensen, S. C. Langford, P. E. Rosenberg, and D. L. Blanchard, "Fracture Induced Emission of Alkali Atoms from Feldspar," Phys. Chem. Minerals 18(7), 453-459 (1992).

143. J. T. Dickinson, S. C. Langford, and L. C. Jensen, "Dissipative Processes Accompanying Fracture" (review article) *Fracture Mechanics of Ceramics*, Vol. 10, R. C. Bradt, D. P. H. Hasselman, D. Munz, M. Sakai, and V. Ya. Shevchenko, Plenum Press (1992), pp. 1-32.

144. J. T. Dickinson, S. C. Langford, and L. C. Jensen, "Simultaneous Bombardment of Wide Bandgap Materials with UV Excimer Irradiation and keV Electrons," J. C. Miller and R. F. Haglund, Jr. eds., *Laser Ablation: Mechanisms and Applications*, Springer Verlag (1991), pp. 301-310.

145. J. T. Dickinson, S. C. Langford, and L. C. Jensen, "The Role of Defects in the Ablation of Wide Bandgap Materials," (review article), *SPIE Proc.* 1598, *Lasers in Microelectronic Manufacturing*, Bodil Braren, Ed., pp. 72-83 (1991).

146. R. L. Webb, S. C. Langford, L. C. Jensen, and J. T. Dickinson, "Ablation of single crystal MgO by UV excimer laser radiation,” Mat. Res. Soc. Symp. Proc. 236, 21 (1992).

147. R. L. Webb, L. C. Jensen, S. C. Langford, and J. T. Dickinson, "Interactions of wide bandgap single crystals with 248 nm excimer laser radiation: I. MgO,” J. Appl. Phys. 74, 2323-2337 (1993).

148. R. L. Webb, L. C. Jensen, S. C. Langford, and J. T. Dickinson, "Interactions of wide bandgap single crystals with 248 nm excimer laser radiation: II. NaCl,” J. Appl. Phys. 74, 2338-2346 (1993).

149. J. T. Dickinson, “Static Progress: Contact Electrification and Adhesion,” *Physics World*, July, 1992, pp. 25-26.

150. M. G. Norton, Wenbiao Jiang, J. T.Dickinson, L. C. Jensen, S.C. Langford, E.L. Fleischer, and J. W. Mayer, “Xenon emission accompanying fracture of xenon-implanted cubic zirconia,” J. Am. Ceram. Soc. 76, 2076 (1993).

151. J. T. Dickinson, L. C. Jensen, and R. P. Dion, “Fracto-Emission from High Density Polyethylene: Bond Breaking vs Tribological Stimulation,” J. Appl. Phys. 73, 3047 (1993).

152. J. T. Dickinson, L. C. Jensen, S. C. Langford, R. P. Dion, and L. Nick, CO emission accompanying fracture of polycarbonate: evidence for molecular cleavage,” J. Mater. Research 8, 14 (1993).

153. D. M. Kulawansa, J. T. Dickinson, and S. C. Langford, and Y. Watanabe, “Scanning Tunneling Microscope Observations of Metallic Glass Fracture Surfaces,” J. Mater. Research 8, 2543 (1993).

154. K. A. Zimmerman, S. C. Langford, J. T. Dickinson, and R. P. Dion, “Electron and photon emission accompanying deformation and fracture of polycarbonate,” J. Polym. Sci.: Part B: Polym. Physics Ed. 31, 1229 (1993).

155. J. Fuhrmann, L. Nick, J. T. Dickinson, and L. C. Jensen, “Photon Emission during deformation of glass-fiber reinforced bisphenol-A- Polycarbonate,” J. Appied Polym. Sci. 48, 2123 (1993).

156. J. T. Dickinson, L. C. Jensen, R. L. Webb, M. L. Dawes, and S. C. Langford , “Interactions of wide bandgap single crystals with 248 nm excimer laser radiation: III. the role of cleavage-induced defects in MgO,” J. Appl. Phys. 74 3758 (1993).

157. J. T. Dickinson, L. C. Jensen, R. L. Webb, M. L. Dawes, and S. C. Langford, “Mechanisms of excimer laser ablation of wide bandgap materials: the role of defects in single crystal MgO,” MRS Symposium Proceedings 285, 131 (1993).

\*158. J. T. Dickinson, “Excitations produced during fracture of polymers and interfaces,” Polym. Prepr. (Am. Chem. Soc, Div. Polym. Chem.) 34(2), 254 (1993).

159. J. T. Dickinson, L. C. Jensen, and S. C. Langford, “Recombination on fractal networks: photon and electron emission following fracture of materials,” J. Mater. Res. 8(11), 2921-2932 (1993).

160. J. T. Dickinson, L. C. Jensen, S. C. Langford, and R. P. Dion, “Ar atom emission as a probe of craze formation and craze growth in polystyrene,” J. Polym. Sci.: Polym. Physics Ed. 31, 1441 (1993).

161. J. T. Dickinson, Jaw-Jung Shin, W. Jiang, and M. G. Norton, “Neutral and ion emissions accompanying pulsed excimer laser irradiation of polytetrafluroethylene (PTFE),”J. Appl. Phys. 74, 4729 (1993).

\*161. J. T. Dickinson, “Time-resolved electrical transient measurements during failure between polymer-metal interfaces,” Polym. Prepr. (Am. Chem. Soc, Div. Polym. Chem.) 34(2), 272 (1993).

162. J. T. Dickinson, L. C. Jensen, S. C. Langford, and R. P. Dion, “Emission of occluded volatiles during elastic deformation of polycarbonate,” J. Polym. Sci.: Polym. Physics Ed. 32, 993 (1994).

163. J. T. Dickinson, L. C. Jensen, S. C. Langford, and R. P. Dion, “Temperature measurements of the gaseous emission during the fracture of polystyrene: a determination of the fracture energy and fracture surface temperature,” J. Polym. Sci.: Polym. Phys. Ed. 32, 779-782 (1994).

164. Xiao-Dong Wang, K. W. Hipps, J. T. Dickinson, and U. Mazur, “Amorphous or nanocrystalline AlN thin films formed from AlN:H, J. Mater. Sci. 9 1449-1455 (1994).

165. J. T. Dickinson, L. C. Jensen, R. L. Webb, and S. C. Langford, “Laser ablation of wide band-gap materials: The role of defects in single crystal MgO,” in *Proceedings of the Second International Conference on Laser Ablation (COLA-II)*, AIP Conf. Proc. 288, edited by J. C. Miller and D. B. Geohegan, pp. 13-25 (1994).

166. D. M. Kulawansa, L. C. Jensen, S. C. Langford, and J. T. Dickinson, and Y. Watanabe, “Scanning tunneling microscope observations of the mirror region of silicate glass fracture surfaces,“ J. Mater. Res. 9, 476-485 (1994).

167. J. T. Dickinson, L. C. Jensen, Sunkyo Lee, Louis Scudiero, and S. C. Langford, (invited review article) “Fracto-emission and electrical transients due to adhesive failure,” J. Adhes. Sci. Technol. 8(11), 1285-1309 (1994).

168. J. T. Dickinson, “The role of defects in the laser ablation of wide bandgap materials,” Nucl. Instrum. Methods Phys. Res. B91, 634-638 (1994).

169. J. T. Dickinson, Jaw-Jung Shin, W. Jiang, and M. G. Norton, “Evidence for unzipping reactions in the laser ablation of polytetrafluoroethylene (PTFE),” Nucl. Instrum. Methods Phys. Res. B91, 672 (1994).

170. J. T. Dickinson, L. C. Jensen, R. L. Webb, and S. C. Langford, “Laser ablation studies relevant to thin film deposition,” ICAM-MRS Proceedings, Transactions of the MRS of Japan, 17 283-288 (1994).

171. J. T. Dickinson, L. C. Jensen, R. L. Webb, J-J. Shin, and S. C. Langford, “The role of defects in the laser ablation of wide bandgap materials,” *Proc. SPIE* 2114, *Laser-Induced Damage in Optical Materials: 1993*, Harold E. Bennett, Lloyd L. Chase, Arthur H. Guenther, Brian E. Newnam, and M. J. Soileau, Eds., pp. 116-126 (1994).

172. Yoshihisa Watanabe, Yoshikazu Nakamura, J. T. Dickinson and S. C. Langford, “Changes in air exposed fracture surfaces of silicate glasses observed by AFM,” J. Non-Cryst. Solids. 177, 9-25 (1994).

173. J. T. Dickinson, L. C. Jensen, and R. L. Webb, “Photoluminescence imaging of mechanically produced defects in MgO,” J. Non-Cryst. Solids. 177, 1-8 (1994).

174. J. T. Dickinson, L. C. Jensen, S. C. Langford, and R. G. Hoagland, “Chemisorptive electron emission as a probe of plastic deformation in reactive metals,” J. Mater. Res. 9(5), 1156-1165 (1994).

175. Y. Watanabe, Y. Nakamura, J. T. Dickinson, D. M. Kulawansa, and S. C. Langford, “Nanometer-scale observations of metallic glass fracture surfaces,” Materials Sci. and Eng. A176, 411-415 (1994).

176. J. T. Dickinson, M. G. Norton, J. J. Shin, W. Jiang, and S. C. Langford, “Excimer laser interactions with PTFE relevant to thin film growth,” in *Gas-Phase and Surface Chemistry in Electronic Materials Processing*, edited by T. J. Mountziaris, P. R. Westmoreland, F. T. J. Smith, and G. R. Paz-Pujalt, (Mater. Res. Soc. Proc. 334), 359-364 (1994).

177. J. T. Dickinson, J. J. Shin, S. C. Langford, and D. Doering, “Positive ion emission from excimer laser excited MgO surfaces,” Phys. Rev. Lett. 73, 2630-2633 (1994).

178. X. D. Wang, U. Mazur, K. W. Hipps, and J. T. Dickinson, "Chemical Stability of Laminated AlN Films," Thin Solid Films 240, 45-51 (1994).

179. M. L. Dawes, J. T. Dickinson, L. C. Jensen, and S. C. Langford, “Structures obtained from resolidification of flame melted single crystal germanium,” Nanotechnology 5, 101-112 (1994).

180. S. Lee, L. C. Jensen, S. C. Langford, , J. T. Dickinson, “Electrical transients generated by the peel of a pressure sensitive adhesive from a copper substrate. Part. I” J. Adhesion Sci. Technol. 9(1), 1-26 (1995).

181. Louis Scudiero, J. T. Dickinson, L. C. Jensen, and S. C. Langford: “Electrical transients generated by the peel of a pressure sensitive adhesive from a copper substrate. Part. II. Analysis of fluctuations,” J. Adhesion Sci. Technol. 9(1), 27-45 (1995).

183. Sumio Nakahara, S. C. Langford, and J. T. Dickinson, “Chemisorptive electron emission and atomic force microscopy as probes of plastic deformation during fracture at a metal/glass interface ,” J. Mater. Res. 10 2033-2041 (1995).

184. Y. Akimune, T. Akiba, N. Hirosaki, and J. T. Dickinson, “Characterization of Si3N4 Surfaces after excimer laser irradiation, Nihon Seramikkusu Kyokai gakujutsu ronbunshi = Journal of the Japan Ceramics Society 103, 128 (1995).

185. T. Akiba, Y. Akimune, N. Hirosaki, and J. T. Dickinson, “Particle emission from Si3N4 Surfaces Induced by excimer laser irradiation,” J. Mater. Sci. Lett. 14, 898 (1995).

186. Wenbiao Jiang, M. Grant Norton, Lancy Tsung, and J. Thomas Dickinson, “Pulsed laser deposition of polytetrafluoroethylene,“ J. Mater. Res. 10(4), 1038-1043 (1995).

187. J. T. Dickinson, L. C. Jensen, K. H. Siek, and K. W. Hipps, “The use of scanning conducting microscopy to probe abrasion of insulating thin films,” Rev. Sci. Instrum. 66(7), 3802-3806 (1995).

188. J.-J. Shin, S. C. Langford, J. T. Dickinson, and Y. Wu, “Electron stimulated neutral and ion emission from single crystal NaNO3,” Nucl. Instrum. Meth. Phys. Res. B. 103, 284-296 (1995).

189. R. L. Webb, S. C. Langford, and J. T. Dickinson, “Neutral atom and molecule emission accompanying 248-nm laser irradiation of single crystal NaNO3,” Nucl. Instrum. Meth. Phys. Res. B. 103, 297-308 (1995).

190. Myong-Won Kim, S. C. Langford, and J. T. Dickinson, “Electron and photon emission accompanying the abrasion of MgO with diamond,” Tribology Lett. 1, 147-157 (1995).

191. J. T. Dickinson, K. H. Siek, and K. W. Hipps, “A Scanning conduction microscopic technique for probing abrasion of thin films,” Tribology Lett. 1, 159-175 (1995).

192. J. T. Dickinson and K. W. Hipps, “Scanning conduction microscopy: a method of probing abrasion of insulating thin films on conducting substrates,” in Polymer/Inorganic Interfaces II (MRS Symp. Proc. 385), edited by L. Drzal, N. A. Peppas, R. L. Opila, and C. Schutte, (Materials Research Society, Pittsburgh, PA, USA 1995), pp. 221-225.

193. J. T. Dickinson, J-J Shin, and S. C. Langford, "Mechanisms of excimer laser induced positive ion emission from ionic crystals," in Film Synthesis and Growth Using Energetic Beams,” edited by H. A. Atwater, J. T. Dickinson, D. H. Lowndes, and A. Polman, MRS Symp. Proc. 388 (Materials Research Society, Pittsburgh, Pennsylvania, 1995), pp. 15-20.

194. Wenbiao Jiang, M. Grant Norton, J. Thomas Dickinson, and N. D. Evans,"Pulsed Laser Deposition of titanium nitride," in Film Synthesis and Growth Using Energetic Beams,” edited by H. A. Atwater, J. T. Dickinson, D. H. Lowndes, and A. Polman, MRS Symp. Proc. 388 (Materials Research Society, Pittsburgh, Pennsylvania, 1995), pp. 103-108.

195. L. Huang, Xiao-Dong Wang, K. W. Hipps, U. Mazur, J. T. Dickinson and R. Heffron, "Chemical Effects of substrate temperature and feed gas composition on ion beam deposited AlN and AlN:H," in *Film Synthesis and Growth Using Energetic Beams*, edited by H. A. Atwater, J. T. Dickinson, D. H. Lowndes, and A. Polman, MRS Symp. Proc. 388 (Materials Research Society, Pittsburgh, Pennsylvania, 1995), pp. 367-372.

196. J. T. Dickinson, S. C. Langford, and Louis Scudiero, “Spatial and temporal probes of deformation and fracture at interfaces,” *Fractal Aspects of Materials* (MRS Symp. Proc. 367), edited by Fereydoon Family, B. Sapoval, P. Meakin, and R. Wool (Materials Research Society, Pittsburgh, PA, 1995), pp. 95-101.

197. S. Nakahara, S. C. Langford, and J. T. Dickinson, “Surface force microscope observations of corrosive tribological wear on single crystal NaNO3 exposed to moist air,” Tribology Lett. 1, 277-300 (1995).

198. L. C. Jensen, S. C. Langford, J. T. Dickinson, and R. S. Addleman, “Mechanistic studies of laser induced breakdown spectroscopy of model environmental samples,” Spectrochimica Acta B 50 1501-1519 (1995).

199. J. T. Dickinson, S. C. Langford, Sumio Nakahara, L. Scudiero, K. W. Hipps, Myoung-Won Kim, and Nam-Seok Park, “Spatial and temporal probes of fracture, wear, and deformation,” in *Fractography of Glasses and Ceramics III*, edited by J. R. Varner, V. D. Fréchette, and G. D. Quinn (*Ceramic transactions.* 64, (1996): 193), American Ceramic Society, Westerville, Ohio, 1996), pp. 193-256.

200. D. R. Ermer, J.-J. Shin, S. C. Langford, and J. T. Dickinson, “Positive ion emission accompanying uv irradiation of single crystal MgO and NaNO3,” in *Advanced Laser Procesing of Materials—Fundamentals and Applications*, edited by R. K. Singh, D. Norton, J. Narayan, J. Cheung, and L. D. Laude, MRS Symp. Proc. 397 (Materials Research Society, Pittsburgh, Pennsylvania, 1996).

201. J. T. Dickinson, J.-J. Shin, and S. C. Langford, “The role of defects in laser induced positive ion emission from ionic crystals,” Appl. Surf. Sci. 96-98, 316-320 (1996).

202. J. T. Dickinson, J. J. Shin, and S. C. Langford, “Laser-induced emission of neutral atoms and molecules from electron-irradiated NaNO3,” Appl. Surf. Sci. 96-98, 326-331 (1996).

203. M. Grant Norton, Wenbiao Jiang, J. Thomas Dickinson, and K. W. Hipps, “Pulsed laser ablation and deposition of fluorocarbon polymers,” Appl. Surf. Sci. 96-98, 617-620 (1996).

204. Nam-Seok Park, Myoung-Won Kim, S. C. Langford, and J. T. Dickinson, “Tribological enhancement of CaCO3 dissolution during scanning force microscopy,” Langmuir 12, 4599-4604 (1996).

205. D. R. Ermer, J.-J. Shin, S. C. Langford, K. W. Hipps, and J. T. Dickinson, “Interaction of wide band gap single crystals with 248 nm excimer laser radiation. IV. Positive ion emission from MgO and NaNO3,“ J. Appl. Phys. 80(11), 6452-6465 (1996).

206. Nam-Seok Park, Myoung-Won Kim, S. C. Langford, and J. T. Dickinson, “Atomic layer wear of single crystal calcite in aqueous solution using scanning force microscopy,” J. Appl. Phys. 80(5), 2680-2686 (1996).

207. L. Huang, X. D. Wang, K. W. Hipps, U. Mazur, R. Heffron, and J. T. Dickinson, "Chemical etching of ion beam deposited AlN and AlN:H," Thin Solid Films 279, 43 (1996).

208. J. J. Shin, Myoung-Won Kim, and J. T. Dickinson, “Effect of tribological wear on UV laser interactions with single crystal NaNO3 and CaCO3,” J. Appl. Phys. 80, 7065-7072 (1996).

209. R. L. Webb, S. C. Langford, and J. T. Dickinson, “The role of defects in the rear side laser ablation of MgO at 308 nm,” J. Appl. Phys. 80, 7057-7064 (1996).

210. Steven C. Langford, and Tom Dickinson, “Applications and mechanisms of laser ablation for elemental analysis of nuclear wastes and contaminated soils,” in *Proc. SPIE* 2835, *Advanced Technologies for Environmental Monitoring and Remediation*, Tuan Vo-Dinh, Ed., pp. 62-72 (1996).

211. R. L. Webb, G. Exarhos, J. T. Dickinson, “Characterization of particulates generated from laser ablation of single crystals of NaNO3,”Appl. Spectroscopy 51(5) 707 (1997).

212. J.-J. Shin, D. R. Ermer, S. C. Langford, and J. T. Dickinson, “The role of photoelectronic processes in the formation of a fluorescent plume on single crystal NaNO3 by 248-nm laser irradiation,” Appl. Phys. A 64, 7-18 (1997).

213. Hongbin Wu, J. T. Dickinson, and S. C. Langford, “Dynamic measurements of the humidity attack on polymer/glass interfaces under stress,” J. Adhesion Sci. and Technol. 11(5) 695-718 (1997).

214. D. R. Ermer, S. C. Langford, and J. T. Dickinson, “Interaction of wide band gap single crystals with 248 nm excimer laser radiation. V. The role of photoelectronic processes in the formation of a fluorescent plume from MgO," J. Appl. Phys. 81(3) 1495-1504 (1997).

215. J. T. Dickinson, L. Scudiero, Kouichi Yasuda, M-W Kim, and S. C. Langford, “Dynamic tribological probes: Particle emission and transient electrical measurements,” Tribology Lett. 3(1) 53-67 (1997).

216.J. T. Dickinson, Nam-Seok Park, Myoung-Won Kim, and S. C. Langford, “A SFM study of a tribochemical process: stress enhanced dissolution,” Tribology Lett. 3(1) 69-80 (1997).

217. S. C. Langford and J. T. Dickinson, "Applications and mechanisms of laser ablation for elemental analysis of nuclear waste and contaminated soils," *Advanced Technologies for Environmental Monitoring and Remediation*, SPIE Proceedings Vol. 2835, edited by Tuan Vo-Dinh (SPIE: The International Society for Optical Engineering, Bellingham, Washington, 1997), pp. 62-72.

218. J. T. Dickinson, D. R. Ermer, J. J. Shin, and S. C. Langford, "A defect-mediated multiple-photon mechanism for ion emission from ionic materials under UV laser irradiation," in *Defects in Insulating Materials*, Mater. Sci. Forum Vol. 239-241, edited by G. E. Matthews and R. T. Williams (Trans Tech Publications, Switzerland, 1997), pp. 641-646.

219. J. T. Dickinson, "Low Fluence Laser Desorption and Plume Formation from Wide Bandgap Crystalline Materials,” in *Laser Ablation and Desorption*, Vol 30 Experimental Methods in the Physical Sciences, J. C. Miller and R. F. Haglund, eds. (Academic Press, 1998, New York), pp. 139-172.

220. J. Thomas Dickinson, D. R. Ermer, J.-J. Shin, and Stephen C. Langford, “Desorption of positive ions and plume formation from laser irradiation of ionic crystals,” in *Proc. SPIE* Vol. 2991, *Laser Applications in Microelectronic and Optoelectronic Manufacturing II*, Jan J. Dubowski, Ed. (SPIE: The International Society for Optical Engineering, Bellingham, Washington, 1997), pp. 2-20.

221. J. T. Dickinson, D. R. Ermer, J.-J. Shin, S. .C. Langford, “Fundamental Mechanisms of Laser Desorption and Plume Formation from Ionic Crystals”: Invited Review Paper, Reza kenkyu = The review of laser engineering, 25 (4) 267 (1997).

222. Lin Huang, K. W. Hipps, J. T. Dickinson, U. Mazur, and X. D. Wang, "Structure and Composition Studies for Silicon Nitrate Thin Films Deposited by Single Ion Beam Sputter Deposition,” Thin Solid Films 299, 104 (1997).

223. J. T. Dickinson, S. C. Langford, W. Faultersack, and H. Yoshizaki, "Application of transient current measurements: evidence for galvanic corrosive wear of aluminum by a polyperfluoroether lubricant," *Wear* 215, 211-212 (1998).

224. L. Scudiero, J. T. Dickinson, and Y. Enomoto, "The electrification of flowing gases by mechanical abrasion of mineral surfaces, Physics and Chemistry of Minerals 25, 566-573 (1998).

225. J. T. Dickinson, D. R. Ermer, J.-J. Shin, and S. C. Langford, "The Dynamics of laser induced particle emission and plume formation from wide bandgap materials," Appl. Surf. Sci. 127-129, 7-20- (1998).

226. S. C. Langford, M. L. Dawes, and J. T. Dickinson, "The role of dehydration in excimer laser interactions with a transparent, hydrated mineral-CaHPO4.2H2O," Appl. Surf. Sci.127-129,81-87 (1998).

227. D. R. Ermer, J. T. Dickinson, and S. C. Langford, "Electrostatic expansion of a laser-induced plasma formed from MgO during irradiation at 248 nm," Appl. Surf. Sci. 127-129, 977-982 (1998).

228. T. Lippert, J. T. Dickinson, S. C. Langford, H. Furutani, H. Fukumura, and H. Mashuhara, "Photopolymers designed for laser ablation photochemical ablation mechanism,” Appl. Surf. Sci. 127-129, 117-121- (1998).

229. R. L. Webb, T. Lippert, S. C. Langford, and J. T. Dickinson, “Sensitization of PMMA to excimer laser ablation at 308 nm wavelength,” Appl. Surf. Sci. 127-129, 815-820- (1998).

230. J. T. Dickinson, L. Scudiero, and S. C. Langford, “A dynamic probe of tribological processes at metal/polymer interfaces: Transient current generation,” in *Structure and Properties of Glassy Polymers*, ACS Symposium Series 710, Martin R. Tant and Anita J. Hill, eds., (American Chemical Society, Washington, D.C., 1998), pp. 272-285.

231. L. Scudiero, S. C. Langford, and J. T. Dickinson, “Improved evidence for chaos during peel of pressure sensitive adhesive tape from a metal substrate,” Proceedings of the First International Congress on Adhesion Science and Technology-Invited Papers, edited by W. J. Van Ooij and H. R. Anderson, Jr. (VSP, Utrecht, The Netherlands, 1998), pp. 585-596.

232. L. Scudiero, S. C. Langford, and J. T. Dickinson, “Electrical currents produced by the peel of a pressure sensitive adhesive: Role of electrostatic forces in adhesion,” Proceedings of the First International Congress on Adhesion Science and Technology-Invited Papers, edited by W. J. Van Ooij and H. R. Anderson, Jr. (VSP, Utrecht, The Netherlands, 1998), pp. 597-613.

233. Thomas K. Lippert, J. Thomas Dickinson, Steve C. Langford, H. Furutani, H. Fukumura, Hiroshi M. Masuhara, Thilo Kunz, and Alexander J. Wokaun, “Laser machining of specially designed photopolymers: Photochemical ablation mechanism,” *Proc. SPIE* Vol. 3404, *ALT’97—International Conference on Laser Surface Processing*, Vladimir I. Pustovoy, Ed., pp. 192-199 (1998).

234. L. Scudiero, M. L. Dawes, S. C. Langford and J. T. Dickinson, “SFM observations of corrosive wear on single crystal brushite (CaHPO4.2H2O) in aqueous solution,” Tribology Letters 6, 41-55 (1999).

235. T. Lippert, R. L. Webb, S. C. Langford, and J. T. Dickinson, “Dopant induced ablation of PMMA at 308 nm,” J. Appl. Phys. 85 1838-1847 (1999).

236. J. Heitz, E. Arenholz, and J. T. Dickinson, J. Appl. Phys. “Particles in laser ablation of polytetrafluoroethylene,” S467 - S470 (1999).

237. J. Heitz and J. T. Dickinson, “Characterization of particulates accompanying laser ablation of pressed polytetrafluoroethylene (PTFE),” Appl. Phys. A 68, 515-523 (1999).

238. J. Heitz, D. Bäuerle, E. Arenholz, N. Arnold, and J. T. Dickinson, "Laser ablation: Fundamentals and application in micropatterning and thin film formation,” Journal of Photoscience, 6 (3),103-106 (1999).

239. C. Bandis, L. Scudiero, S. C. Langford, and J. T. Dickinson, “Photoelectron emission studies of cleaved and excimer irradiated single crystal surfaces of NaNO3 and NaNO2,” Surf. Sci. 442(3) 413-419 (1999).

240. R. Hariadi, S. C. Langford, and J. T. Dickinson, “Atomic force microscope observations of particle detachment from substrates: the role of water vapor in tribological debonding,” J. Appl. Phys. 86 4885-4891 (1999).

241. T. Lippert, S. C. Langford, A. Wokaun, Georgiou Savas, and J. T. Dickinson, “Analysis of neutral fragments from ultraviolet laser irradiation of a photolabile triazeno-polymer,” J. Appl. Phys. 86(12) 7116-7122 (1999).

242. Richard M. Williams, Kenneth M. Beck, Alan G. Joly, J. Thomas Dickinson, and Wayne P. Hess, “Pulse-width influence on laser-induced desorption of positive ions from ionic solids,” in Proc. SPIE Vol. 3618, p. 37-44, Laser Applications in Microelectronic and Optoelectronic Manufacturing IV, Jan J. Dubowski; Henry Helvajian; Ernst W. Kreutz; Koji Sugioka; Eds., (1999).

243. J. T. Dickinson, R. Hariadi, and S. C. Langford, “Nanometer scale investigations of chemical mechanical polishing mechanisms using scanning force microscopy,” invited review, in *Finishing of Advanced Ceramics and Glasses*, (Ceramics Transactions, Volume 102), American Ceramics Society, Westerville, OH, pp. 213-232 (1999).

244. J. T. Dickinson, R. F. Hariadi, L. Scudiero, and S. C. Langford, “A scanning force microscope study of detachment of nanometer-sized particles from glass surfaces,” Tribology Lett. 7, 113-119 (1999).

245. Y. Kawaguchi, M. L. Dawes, S. C. Langford, and J. T. Dickinson, “Effect of heat treatment on UV laser induced positive ion desorption in CaHPO4.2H2O,” Appl. Phys. A 69(7), 621-624 (2000).

246. C. Bandis, S.C. Langford, J.T. Dickinson, D.R. Ermer “Laser desorption of energetic ions from single crystal NaNO3 at 1064 nm,” Appl. Phys. A 69(7), 129-132 (2000).

247. S. C. Langford, J. T. Dickinson, and M. L. Alexander, “The production of sub-micron sodium nitrate particles by laser ablation,” Appl. Phys. A 69(7), 647-650 (2000).

248. J. T. Dickinson, R. Hariadi, and S. C. Langford, “Mechanical detachment of nanometer particles strongly adhering to a substrate: an application of corrosive tribology,” J. Adhesion (Invited: Special Issue) 74 373-390 (2000).

249. M. L. Dawes, W. Hess, Y. Kawaguchi, S. C. Langford, and J. T. Dickinson, “Laser-induced positive ion and neutral atom/molecule emission from single crystal CaHPO4.2H2O: The role of electron beam induced defects,” Appl. Phys. A 69(7) 547-552 (2000)

250. C. Bandis, L. Scudiero, S. C. Langford, and J. T. Dickinson,, “Positive ion emission from ionic crystals accompanying 248 nm laser irradiation, Appl. Phys. Lett. 76(4), 421–423, (2000).

251. J. T. Dickinson, S. C. Langford, Christos Bandis, M. L. Dawes, and Y. Kawaguchi. "Consequences of combining laser irradiation with other stimuli on laser desorption and ablation from wide bandgap insulators," Appl. Surf. Sci. 154-155, 291-304 (2000).

252. Y. Kawaguchi, M. L. Dawes, S. C. Langford, and J. T. Dickinson, “Interaction of wide bandgap single crystals with 248 nm excimer laser irradiation. VI. The influence of thermal pre-treatment on laser desorption of positive ions from a water-containing ionic crystal (CaHPO4·2H2O)” J. Appl. Phys. 88 647-656 (2000).

253. Wayne P. Hess, Alan G. Joly, Kenneth M. Beck, Richard M. Williams, J. Thomas Dickinson, “Femto-second Time-Resolved Laser Induced Desorption of Positive Ions from MgO,” Appl. Phys. A 69(7) 389-393 (2000).

254. T. Lippert , A. Wokaun , S.C. Langford , J.T. Dickinson “Emission of neutral molecules during UV laser ablation of a photolabile triazeno polymer,” 69(7) Appl. Phys. A 69(7) 655-658 (2000).

255. C. Bandis, S. C. Langford, J. T. Dickinson, D. R. Ermer, and Noriaki Itoh, “Laser desorption of energetic ions from single crystal NaNO3 at 1064 nm,” J. Appl. Phys. 87(3) 1522-1528 (2000).

256. J. T. Dickinson, Y. Kawaguchi, M. L. Dawes, S. C. Langford, and J. T. Dickinson, “Onset of laser plume formation at 248 nm on cleaved single crystal NaCl: Evidence for highly localized emissions,” Proc. SPIE Vol. 3935, *Laser Plasma Generation and Diagnostics*, Richard F. Haglund and Richard F. Wood; Eds.,p. 38-46, *(2000).*

257. Christos Bandis, Y. Kawaguchi, Mary L. Dawes, Steve C. Langford, and J. Thomas Dickinson, “Investigations of laser desorption from modified surfaces of ionic single crystals,” Proc. SPIE Vol. 3933, p. 2-13, *Laser Applications in Microelectronic and Optoelectronic Manufacturing V*, Henry Helvajian; Koji Sugioka; Malcolm C. Gower; Jan J. Dubowski; Eds *(2000)*

258. J. T. Dickinson, R. F. Hariadi, L. Scudiero, and S. C. Langford, “Scanning force microscope study of detachment of nanometer adhering particles,” Mater. Sci. Engin. A288, 182-186 (2000).

259. J. Thomas Dickinson, Christos Bandis, and Stephen C. Langford, “When a mild-mannered 1-5 eV photon meeta a big 10 eV Bandgap: studies of laser desorption from modified surfaces of ionic single crystals,” *in Laser-Solid Interactions for Materials Processing* MRS Proc. 617, pp. 1-12, D. Kumar, D.P. Norton, C.B. Lee, K. Ebihara, X. Xi, Eds. (2000).

260. S. D. Ibsen, N. Z. Hertelendy, S. C. Langford, and J. T. Dickinson, “Effect of humidity on the failure of ethylene vinyl acetate/soda lime glass interfaces under simple tension using small samples,” J. Adhesion Sci. Technol. 15(5), 613-629 (2001).

261. Y. Kawaguchi, M. L. Dawes, S. C. Langford, and J. T. Dickinson, “Interaction of wide bandgap single crystals with 248 nm excimer laser irradiation. VII. Localized Plasma Formation on NaCl single surfaces,” J. Appl. Phys. 89 2370-2378 (2001).

262. S. Kano, S. C. Langford, and J. T. Dickinson, “Interaction of wide bandgap single crystals with 248 nm excimer laser irradiation VIII. Laser desorption of molecular ions from MgO,” J. Appl. Phys 89(5) 2950 (2001).

263. J. T. Dickinson, “Fracto-Emission”, in *Encyclopedia of Materials: Science and Technology,* Editors-in-Chief-- K.H. Jürgen Buschow, Robert W. Cahn, Merton C. Flemings, Bernhard Ilschner, Edward J. Kramer, and Subhash Mahajan, Elsevier, London (2001).

264. R. J. Greve, S. C. Langford, and J. T. Dickinson, “Oxidation and reduction reactions responsible for galvanic corrosion of ferrous and reactive metals in the presence of a perfluoropolyether lubricant,” Wear 249(8), 727-732 (2001).

265. J. T. Dickinson, C. Bandis, and S. C. Langford, “Fundamental studies of laser desorption from modified surfaces of ionic crystals,” Radiation Effects and Defects in Solids, 156 59-67 (2001).

266. J. T. Dickinson, R. F. Hariadi, and S. C. Langford, “Mechanical detachment of nanometer particles strongly adhering to a substrate,” invited review chapter in *Particle Adhesion: Applications and Advances*, David J. Quesnel, Donald S. Rimai, and Louis H. Sharpe, ed., Taylor and Francis, New York, 2001.

267. Yoshizo Kawaguchi, Steve C. Langford, and J. T. Dickinson, “Plume formation and optical breakdown on KrF excimer laser-irradiated silica glass,” in *Laser Applications in Microelectronic and Optoelectronic Manufacturing VI*, *Proc. SPIE* Vol. 4274, Malcolm C. Gower, Henry Helvajian, Koji Sugioka, and Jan J. Dubowski, Eds., pp. 258-265 (2001).

268. A. G. Joly, W. P. Hess, K. M. Beck, and J. T. Dickinson, “Femtosecond time-resolved photo-stimulated desorption from ionic crystals,” Appl. Surf. Sci. 186, 339-345 (2002).

269. L. Cramer, S. C. Langford, W. Hess and J. T. Dickinson, “Fundamental studies of photodesorption of cations from ionic inorganic crystals at 157 nm, Appl. Surf. Sci. 197-198, 35-40 (2002).

270. T. Lippert, J. T. Dickinson, M. Hauer, G. Kopitkovas, S. C. Langford, H. Masuhara, O. Nuyken, J. Robert, T. Tada, K. Tomita, and A. Wokaun, “Polymers designed for laser ablation—Influence of photochemical properties,” Appl. Surf. Sci., 197-198, 746-756 (2002).

271. Y. Kawaguchi, A. Narazaki, T. Sato, H. Niino, A. Yabe, S. C. Langford, and J. T. Dickinson, Kunihito Nagayama, Kazunari Inou and Motonao Nakahara, “The onset of optical breakdown in KrF-laser-irradiated silica glass,” Appl. Surf. Sci. 197-198, 50-55 (2002).

272. K. Nwe, S. C. Langford, and J. T. Dickinson, “The effect of water vapor and bulk temperature on positive ion emission from wide bandgap single crystals during exposure to 248 nm excimer laser irradiation,” Appl. Surf. Sci. 197–198, 83-89 (2002).

273. C. Bandis, T. Holt, L. Cramer and J. T. Dickinson, “On the white light luminescence induced by irradiation of sodium nitrate single crystals by 1064 nm laser light,” Appl. Surf. Sci. 197-198, 100-106 (2002).

274. M. Hauer, T. Dickinson, S. Langford, T. Lippert, A. Wokaun, “Influence of the irradiation wavelength on the ablation process of designed polymers,“ Appl. Surf. Sci. 197-198, 791 (2002).

275. Friedemann Freund, J. Thomas Dickinson, and Michele Cash, “Hydrogen in rocks: An energy source for deep microbial communities,” Astrobiology 2(1), 83-92 (2002).

276. Wayne P. Hess, Alan G. Joly, Kenneth M. Beck, and J. Thomas Dickinson, “Time-resolved femtosecond laser desorption from wide-bandgap single crystals,” Proc. SPIE Vol. 4760, *High-Power Laser Ablation IV*, Claude R. Phipps, Ed., pp. 318-325 (2002).

277. J. Thomas Dickinson, Khin Hla Nwe, and Steve C. Langford, “Synergisms at surfaces involving radiation and solvents: Nanometer-scale implications,” in Proc. SPIE Vol. 4760, *High-Power Laser Ablation IV*, Claude R. Phipps, Ed., pp. 192-203 (2002).

278. J. T. Dickinson, M. L. Dawes, Khin Hla Nwe, and S. C. Langford, “Consequences of combined chemical and radiative exposure of solid surfaces,” invited review, in Proc. SPIE Vol. 4637*, Photon Processing in Microelectronics and Photonics*, Koji Sugioka; Richard F. Haglund, Alberto Pique, Frank Traeger, Jan J. Dubowski, and Willem Hoving, Eds., pp. 1-12 (2002).

279. J. T. Dickinson, “Physical and chemical aspects of laser materials interactions relevant to laser processing,” invited review in Proc. SPIE Vol. 4637*, Photon Processing in Microelectronics and Photonics*, Koji Sugioka; Richard F. Haglund, Alberto Pique, Frank Traeger, and Jan J. Dubowski, Eds., pp. 453-464 (2002).

280. R. Hariadi, S. C. Langford, and J. T. Dickinson, “Controlling nanometer-scale crystal growth on a model biomaterial with a scanning force microscope,” *Langmuir* 18(21), 7773-7776 (2002).

281. W. Maw, F. Stevens, S. C. Langford, and J. T. Dickinson, “Single asperity tribochemical wear of silicon nitride studied by atomic force microscopy,” J. Appl. Phys. 92 5103-5109 (2002).

282. J. V. Wasem, P. Upadhyaya, S. C. Langford, and J. T. Dickinson, “Transient current generation during wear of high density polyethylene by a stainless steel stylus,” J. Appl. Phys. 93(1) 719-730 (2003).

283. J. V. Wasem, B. L. LaMarche, S. C. Langford, and J. T. Dickinson, “Triboelectric charging of Fomblin ZDOL perfluoropolyether lubricants,” J. Appl. Phys. 93(4), 2002-2007 (2003).

284. T. Lippert and J. T. Dickinson, “Chemical and spectroscopic aspects of polymer ablation: Special features and novel directions,” invited review, Chemical Reviews, 103(2) 453-486 (2003). (contains ~ 400 references).

285. Myoung-Won Kim, L. C. Jensen, S. C. Langford, and J. T. Dickinson, “Emission of neutral Mg from MgO during abrasion with diamond,” J. Appl. Phys. 93(4) 1819-1825, (2003).

286. J. T. Dickinson, “Nanometer-scale surface modification using scanning force microscopy in chemically active environments,” *Surface Modifications and Processing: Physical & Chemical Tribological Methodologies*, edited by G. Totten and Hong Liang (Marcel Dekker, New York, 2003) pp. 671-699.

287. J. B. Lonzaga, S. M. Avanesyan, S. C. Langford, and J. T. Dickinson, “Color center formation in soda lime glass with femtosecond laser pulses,” J. Appl. Phys. 94(7),4332-4341 (2003).

288. Forrest Stevens, Steve Langford, and J. Thomas Dickinson, “Single Asperity Chemical Mechanical Wear Studied by Atomic Force Microscopy”, in Chemical-Mechanical Planarization, Materials Research Society Editors: Duane S. Boning, Katia Devriendt, Michael R. Oliver, David J. Stein, Ingrid Vos, Vol. 767, (2003).

289. R. Leach, F. Stevens, and J. T. Dickinson, “Nanometer-scale solvent-assisted modification of polymer surfaces using scanning force microscopy”, Langmuir 19(24), 10225-10232 (2003).

290. J. T. Dickinson, Khin Nwe, W. P. Hess, and S. C. Langford, “Synergistic effects of exposure of surfaces of ionic crystals to radiation and water,” Appl. Surf. Sci. 208, 2-15 (2003).

291. J. T. Dickinson, S. Orlando, S. M. Avanesyan, and S. C. Langford, "Color center formation in soda lime glass and NaCl single crystals with femtosecond laser pulses," Appl. Phys. A. 79, 859-864 (2004).

292. S. M. Avanesyan, S. Orlando, S. C. Langford, J. T. Dickinson, "Formation of high density color centers in insulator materials using ultrafast lasers,” in Proc. SPIE Vol. 5339, *Photon Processing in Microelectronics and Photonics,* Peter R. Herman, et al. Ed.pp. 568-578 (2004).

293. Sergey M. Avanesyan, Stefano Orlando, Steve C. Langford, J. Thomas Dickinson, “Generation of color centers by femtosecond laser pulses in wide-bandgap materials”, Proc. SPIE Vol. 5352, Ultrafast Phenomena in Semiconductors and Nanostructure Materials VIII, Kong-Thon Tsen et. al. Ed., pp. 169-179 (2004).

294. Joel B. Lebret, Loren P. Cramer, M. Grant M. Norton, and J. T. Dickinson, [Colloid formation and laser-induced bleaching in fluorite](http://firstsearch.oclc.org/WebZ/FSFETCH?fetchtype=fullrecord:sessionid=sp06sw04-46962-e5fzote7-htury2:entitypagenum=4:0:recno=9:resultset=1:format=FI:next=html/record.html:bad=error/badfetch.html:entitytoprecno=9:entitycurrecno=9:numrecs=1), Appl. Phys. Lett. 85(19) 4382-4385 (2004).

295. M. Cai, S. C. Langford, L. E. Levine, and J. T. Dickinson, “[Determination of strain localization in aluminum alloys using laser-induced photoelectron emission](http://firstsearch.oclc.org/WebZ/FSFETCH?fetchtype=fullrecord:sessionid=sp06sw04-46962-e5fzote7-htury2:entitypagenum=4:0:recno=7:resultset=1:format=FI:next=html/record.html:bad=error/badfetch.html:entitytoprecno=7:entitycurrecno=7:numrecs=1)”, J. Appl. Phys. 96(12), 7189-7194 (2004).

296. K. H. Nwe, S. C. Langford, and J. T. Dickinson, “Interaction of wide band gap single crystals with 248 nm excimer laser irradiation. IX. Photo-induced atomic desorption from cleaved NaCl(100) surfaces,” J. Appl. Phys. 98, 13506 (2005).

297. K. H. Nwe, S. C. Langford, and J. T. Dickinson, “[Interaction of wide-band-gap single crystals with 248-nm excimer laser irradiation. X. Laser-induced near-surface absorption in single-crystal NaCl](http://firstsearch.oclc.org/WebZ/FSFETCH?fetchtype=fullrecord:sessionid=sp06sw04-46962-e5fzote7-htury2:entitypagenum=4:0:recno=2:resultset=1:format=FI:next=html/record.html:bad=error/badfetch.html:entitytoprecno=2:entitycurrecno=2:numrecs=1),” J. Appl. Phys. 97(4), 43501 (2005).

298. K. H. Nwe, S. C. Langford, and J. T. Dickinson, “[Interaction of wide-band-gap single crystals with 248-nm excimer laser radiation. XI. The effect of water vapor and temperature on laser desorption of neutral atoms from sodium chloride](http://firstsearch.oclc.org/WebZ/FSFETCH?fetchtype=fullrecord:sessionid=sp06sw04-46962-e5fzote7-htury2:entitypagenum=4:0:recno=1:resultset=1:format=FI:next=html/record.html:bad=error/badfetch.html:entitytoprecno=1:entitycurrecno=1:numrecs=1),” J. Appl. Phys. 97(4), 43502 (2005).

299. L. P. Cramer, B. Schubert, P. Petite, S. C. Langford, and J. T. Dickinson, “Laser interactions with embedded Ca metal nanoparticles in single crystal CaF2,” J. Appl. Phys. 97(7), 74307 (2005).

300. L. P. Cramer, T. D. Cumby, J. A. Leraas, S. C. Langford, and J. T. Dickinson, “Effect of surface treatments on STE luminescence in single crystal CaF2,” J. Appl. Phys.97(10), 103533 (2005).

301. S. M. Avanesyan, S. Orlando, S. C. Langford, and J. T. Dickinson, “Through a glass, darkly": point defect production by ultrafast laser irradiation of alkali-containing silica glasses and alkali halide single crystals, SPIE Proceedings Volume 5647, *Laser-Induced Damage in Optical Materials: 2004,* Gregory J. Exarhos, Arthur H. Guenther, Norbert Kaiser, Keith L. Lewis, M. J. Soileau, Christopher J. Stolz, Editors, pp. 501-512 (2005).

302. S. Orlando, S. M. Avanesyan, S. C. Langford, and J. T. Dickinson, “Point defect production by ultrafast laser irradiation of alkali-containing silica glasses and alkali halide single crystals”, Appl. Surf. Sci. 248(1-4), 129-137 (2005).

303. M. Cai, L. E. Levine, S. C. Langford, and J. T. Dickinson, “Observation of dislocation motion in single crystal and polycrystalline aluminum during uniaxial deformation using a photoemission technique”, Mater. Sci. Engin. A 401-402, 476-480 (2005).

304. Matthias Henyk, Kenneth M. Beck, Mark H. Engelhard, Alan G. Joly, Wayne Hess, and J. Thomas Dickinson, “Surface electronic properties and site–specific desorption processes studied at highly structured nanoporous MgO thin films,” Surf. Sci., 593 242 (2005).

305. J. T. Dickinson, “Rubbing on a Small Scale,” invited review, J. Chem. Ed. 82(5), 734-742 (2005).

306. F. Stevens, S. C. Langford, and J. T. Dickinson, “Tribochemical wear of sodium trisilicate glass at the nanometer size scale,” J. Appl. Phys. 99(2), 023529 (2006).

307. F. Stevens, R. N. Leach, S. C. Langford, and J. T. Dickinson, “Influence of molecular weight on nano-scale modification of poly(methyl methacrylate) due to simultaneous mechanical and chemical stimulationLangmuir 22(7), 3320 -3325 (2006).

308. Gang Xiong, Alan G. Joly, Kenneth M. Beck and Wayne P. Hess, Mingdong Cai, Stephen C. Langford, and J. Thomas Dickinson, “In-situ photoelectron emission microscopy of a thermally-induced martensitic transformation in a CuZnAl shape memory alloy”, Appl. Phys. Lett. 88, 091910, (2006).

309. J. T. Dickinson, “Studies of Tribochemistry on the Nanometer Size Scale”, invited review paper, Conference Proceedings on Chemical Mechanical Polishing, Institute for Microelectronics and Interconnection, 2006.

310. J. T. Dickinson, “Single Asperity Nanometer-Scale Studies of Tribochemistry,” invited review chapter, in Nanotribology: Friction and Wear on the Atomic Scale, edited by Ernst Meyer and Enrico Gnecco (Springer, Berlin, 2006).

311. L. P. Cramer, S. C. Langford, and J. T. Dickinson, “The formation of metallic nanoparticles in single crystal CaF2 under 157 excimer laser irradiation”, J. Appl. Phys. 99, 054305-054310 (2006).

312. A. L. McEvoy, S. C. Langford, and J. T. Dickinson, “Induced nanometer scale growth of calcite with the Atomic Force Microscope,” Langmuir 22(16), 6931-6938 (2006).

313. Hongbo Cao; Dong Ma; Ker-Chang Hsieh; Ling Ding; William G. Stratton; Paul M. Voyles; Ye Pan; Mingdong Cai; J. T. Dickinson; Y.A. Chang, “Computational thermodynamics to identify Zr-Ti-Ni-Cu-Al alloys with high glass forming ability,” Acta Materialia 54, 2975-2982 (2006).

314. J. T. Dickinson, “Physical and chemical aspects of laser materials interactions,” invited review chapter in *Proceedings of the NATO ASI Workshop on Photon-based Nanoscience and Technology: Materials, Diagnostics and Nanobiodevices*, NATO Science Series, (2006).

315. Gang Xiong, A. Joly, W.P. Hess, Mingdong Cai, and J. T. Dickinson, “Introduction to photoelectron emission microscopy: principles and applications,” invited review paper, Journal of the Chinese Electron Microscopy Society 25(1), 16-24 (2006).

316. R. N. Leach, F. Stevens, S. C. Langford, and J. T. Dickinson, “Dropwise condensation: Experiments and simulations of nucleation and growth of water drops in a cooling system,” Langmuir 22,8864-8872 (2006).

317. M. Cai, W. Li, and J. T. Dickinson, “Simultaneous measurements of photoemission and morphology of various Al alloys during mechanical deformation,” J. Appl. Phys. **100**, 103518-103528 (2006).

318. S. R. John, J. Lerass, S. C. Langford, and J. T. Dickinson, “Ion emission from fused silica under 157-nm excimer laser irradiation at fluences below plasma formation threshold: the role of surface defects,” in *High-Power Laser Ablation VI*, edited by Claude R. Phipps, Proceedings of the SPIE, Volume 6261, pp. 626108 (2006).

319. M. Cai, M. R. Stoudt, L. E. Levine, and J. T. Dickinson, “A combined study of surface roughness in polycrystalline aluminium during uniaxial deformation using laser-induced photoemission and confocal microscopy,” Philosophical Magazine 87(6) 907-924 (2007).

320. S. Orlando, S. C. Langford, and J. T. Dickinson, “Color center production by ultrafast laser irradiation of potassium bromide and potassium chloride,” Appl. Surf. Sci. 253, 7874–7878 (2007) .

321. M. Cai, S. C. Langford, J. T. Dickinson, M. J. Wu, W. M. Huang, Gang Xiong, T. C. Droubay, A. G. Joly, K. M. Beck, and W. P. Hess, “Study of martensitic phase transformation in a NiTiCu thin film shape memory alloy using PEEM,” Advanced Functional Materials, 17, 161-167 (2007).

322. M. Cai, Y.Q. Fu, S. Sanjabi; Z. Barber; J. T. Dickinson, “Effect of composition on surface relief morphology in TiNiCu thin films”, Surface and Coatings Technology 201 5843–5849 (2007).

323. J. T. Dickinson and B. Shipley, “A Linux Based On-Line Science Quizzing and Tutoring System,” FreeWare—download available at SourceForge.net (<http://sourceforge.net/>)

324. S. R. John, J. A. Leraas, S. C. Langford, and J. T. Dickinson, “Laser-induced ion emission from wide bandgap materials,” Appl. Surf. Sci. 253(15), 6283-6288 (2007).

325. M. Cai, S. C. Langford, J. T. Dickinson, Gang Xiong , T. C. Droubay, A. G. Joly, K. M. Beck, W. P. Hess, "An in situ study of the martensitic transformation in shape memory alloys using photoemission electron microscopy," Journal of Nuclear Materials 361, 306–312 (2007).

326. R. Imoto, F. Stevens, S. C. Langford, and J. T. Dickinson, “AFM investigations of chemical-mechanical processes on silicon(100) surfaces= MRS Symp. Proc. –Advances and Challenges in CMP (Materials Research Society, Pittsburgh, Pennsylvania 991, 93-105 2007).

327. Sharon R. John, J. A. Leraas, S. C. Langford, and J. T. Dickinson, “Ion emission from fused silica under 157-nm irradiation,” J. Phys.: Conf. Series 59, 736-739 (2007).

328. M. Cai, S. C. Langford, J. T. Dickinson, David J. Pitchure, and Lyle E. Levine, “Laser-induced photoemission as a probe of slip band formation in single crystal and polycrystalline aluminum during uniaxial deformation,” J. Phys.: Conf. Series 59, 678-681 (2007).

329. M. Kuhnke, L. Cramer, L.; P. E. Dyer, J. T. Dickinson, T. Lippert, H. Niino, M. Pervolaraki, C. D. Walton, and A. Wokaun, “F2 excimer laser (157 nm) ablation of polymers: Relation of neutral and ionic fragment detection and absorption,” J. Phys.: Conf. Series 59, 625-631 (2007).

330. M. Cai, S. C. Langford, J. T. Dickinson, and L. E. Levine, “Deformation of cube-textured aluminum studied using laser-induced photoelectron emission,” J. Mater. Sci. 22(9), 2582-2589 (2007).

331. C. Bates, F. Stevens, S. C. Langford, and J. T. Dickinson, “Nanoscale craters in poly(methyl methacrylate) formed by exposure to condensing solvent vapor,” Journal of Materials Research 22(12), 2007.

332. K. Kimura, S. C. Langford, and J. T. Dickinson, “Interaction of wide-band-gap single crystals with 248-nm excimer laser radiation. XII. The emission of negative atomic ions from alkali halides,” J. Appl. Phys. 102(11), 114904 (2007).

333. Zsuzsanna Balogh-Brunstad, C. Kent Keller, J. Thomas Dickinson, Forrest Steven, C.Y. L., and Bernard T. Borman, “Biotite weathering and nutrient uptake by ectomycorrhizal fungus, Suillus tomentosus, in liquid-culture experiments,” [Geochimica et Cosmochimica Acta](http://www.sciencedirect.com/science/journal/00167037), 72(11), 2601-2618 (2008).

334. C. M. Bates, F. Stevens, S. C. Langford, and J. T. Dickinson, “The motion and dissolution of drops of sparingly soluble alcohols on water,” Langmuir **24*(***14), 7193–7199 (2008).

335. J. T. Dickinson, “Observation of negative alkali ions from alkali halides during 248-nm laser irradiation,” Appl. Phys. A. 92, 1025-1030 (2008).

336. S.R. John, S.C. Langford, J.T. Dickinson, “Ablation mechanism of PTFE under 157 nm irradiation,” Appl. Phys A 92, 981–985 (2008).

337. Mingdong Cai, Stephen C. Langford, and J. Thomas Dickinson, “Orientation dependence of slip band formation in single-crystal aluminum studied by photoelectron emission,” Acta Materialia 56(20) 5938-5945 (2008).

338. R. Bennewitz and J. T. Dickinson, “Fundamental Studies of Nanometer-Scale Wear Mechanisms,” **(INVITED REVIEW),** MRS Bulletin (Materials Research Society), 33(12) 1174-1181 (2008).

339. R. Imoto, F. Stevens, S.C. Langford, and J.T. Dickinson, “Atomic force microscopy studies of chemical–mechanical processes on silicon (100) surfaces,” (**Invited Review**), Appl. Phys. A 94, 35–43 (2009).

340. E. H. Khan, S. C. Langford, J. T. Dickinson, Lynn A. Boatner, and Wayne P. Hess “Photo-induced formation of zinc nanoparticles by UV laser irradiation of ZnO”, Langmuir 25(4), pp 1930–1933 (2009).

341. A. Soudi, E. H. Khan, J. T. Dickinson, and Y. Gu, “Observation of unintentionally incorporated nitrogen-related complexes in ZnO and GaN nanowires,” Nano Lett. 9(5), 1844-1849 (2009).

342. Sharon R. George, John A. Leraas, and Stephen C. Langford, J.T. Dickinson, “Interaction of 157-nm excimer laser radiation with fluorocarbon polymers,” Appl. Surf. Sci. 255(24) 9556-9561 (2009).

343. S. Orlando, S. C. Langford, J. T. Dickinson, Generation of color centers in alkali halide single crystals using ultrafast laser pulses, J. Optoelectronics and Adv. Mat. 12 (3), 707- 710 (2010).

344. Sharon R. George, J. A. Leraas, S. C. Langford, and J. T. Dickinson, "Interaction of vacuum ultraviolet excimer laser radiation with fused silica: I. Positive ion emission", J. Appl. Phys. 107(3), 033107 (2010).

345. Sharon R. George, S. C. Langford, and J. T. Dickinson, "Interaction of vacuum ultraviolet excimer laser radiation with fused silica: II. Neutral emission", J. Appl. Phys. J. Appl. Phys. 107(3), 033108 (2010).

346. Sharon R. George, S. C. Langford, and J. T. Dickinson, "Interaction of vacuum ultraviolet excimer laser radiation with fused silica: III. Negative ion formation", J. Appl. Phys. J. Appl. Phys. 107(3), 033109 (2010).

347. M. Cai, R. E. Ricker, L. E. Levine, S. C. Langford, and J. T. Dickinson, “[The effect of thermal oxidation on laser-induced photoelectron emission during tensile deformation of polycrystalline aluminum](http://link.aip.org/link/japiau/v107/i5/p053526/s1)”, J. Appl. Phys. **107**, 053526 (2010)

348. Kenichi Kimura, S. Langford, J. Thomas Dickinson, "The Emission of Negative Potassium Ions from Single Crystal Potassium Bromide during Exposure to 248-nm Excimer Laser Radiation", **(Invited Contribution)** J. Phys. Chem.-C **114** (12), 5700–5708 (2010).

349. E. H. Khan, S. C. Langford, J. T. Dickinson, "Zinc ion and neutral emission from single crystal zinc oxide during 193-nm excimer laser exposure", SPIE Proceedings, LAMOM Conference 7920, 2011

350. M. Cai, S. C. Langford, and J. T. Dickinson, "[Tribochemical wear of single crystal aluminum in NaCl solution studied by atomic force microscopy](http://link.aip.org/link/japiau/v110/i6/p063509/s1)", J. Appl. Phys. 107, 063509 (2011).

350. Enamul Khan, S. C. Langford, and, J. T. Dickinson, [Positive ion emission from oxidized aluminum during ultraviolet excimer laser irradiation](http://link.aip.org/link/japiau/v110/i2/p023110/s1), J. Appl. Phys. 110, 023110 (2011).

351. Enamul Khan, S. C. Langford, J. T. Dickinson, and Lynn Boatner, “The interaction of 193-nm excimer laser irradiation with single-crystal zinc oxide: Positive ion emission", J. Appl. Phys. 111, 063101 (2012).

352. Enamul Khan, S. C. Langford, J. T. Dickinson, and Lynn Boatner, “The interaction of 193-nm excimer laser irradiation with single-crystal zinc oxide: Neutral atomic zinc and oxygen emission", J. Appl. Phys. 114, 053511 (2013).

353. Enamul Khan, S. C. Langford, J. T. Dickinson, and Lynn Boatner, “The interaction of 193-nm excimer laser irradiation with single-crystal zinc oxide: The generation of atomic Zn line emission at laser fluences below breakdown", J. Appl. Phys. 114, 083102 (2013).

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E. H. Khan, S. C. Langford, J. T. Dickinson, "The production of long lived Zn atom Rydberg states from laser irradiation of single crystal ZnO at 193 nm wavelength,” to be submitted to J. Appl. Phys.

S. R. John, S. C. Langford, and J. T. Dickinson, “Ion and Neutral Particle Emission from polytetrafluoroethylene (PTFE) under 157-nm excimer laser irradiation,” in preparation.

K. H. Nwe, S. C. Langford, and J. T. Dickinson, “Interaction of wide band gap single crystals with 248 nm excimer laser irradiation. XIII: Photochemical and photomechanical response of inorganic single crystals at the nanometer size scale,” in preparation.

J. A. Leraas, S. Rose, S. C. Langford, and J. T. Dickinson, “Ion and Neutral Particle Emission from poly(vinylidene fluoride) (PVDF) and poly(chlorotrifluoroethylene) (Kel-F) under 157-nm excimer laser irradiation,” in preparation.

J. T. Dickinson, “The WSU On line Quizzing and Tutoring System: keeping students engaged”, in preparation.