Stanford



William Nix

Lee Otterson Professor in the School of Engineering, Emeritus

Materials Science and Engineering

Bio

BIO

I have been engaged in the study of mechanical properties of materials for nearly 50 years. My early work was on high temperature creep and fracture of metals, focusing on techniques for measuring internal back stresses in deforming metals and featuring the modeling of diffusional deformation and cavity growth processes. My students and I also studied high temperature dispersion strengthening mechanisms and described the effects of threshold stresses on these creep processes. Since the mid-1980's we have focused most of our attention on the mechanical properties of thin film materials used in microprocessors and related devices. We have developed many of the techniques that are now used to study of thin film mechanical properties, including nanoindentation, substrate curvature methods, bulge testing methods and the mechanical testing of micromachined (MEMS) structures. We are also known for our work on the mechanisms of strain relaxation in heteroepitaxial thin films and plastic deformation of thin metal films on substrates. In addition we have engaged in research on the growth, characterization and modeling of thin film microstructures, especially as they relate to the development of intrinsic stresses. Some of our recent work dealt with the mechanical properties of nanostructures and with strain gradients and size effects on the mechanical properties of crystalline materials. Our most recent work deals with the mechanical properties of lithiated nanostructures that are being considered for lithium-ion battery applications.

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Materials Science and Engineering

HONORS AND AWARDS

- Fellow (FRS), The Royal Society of London (2024)
- The William D. Nix Lecture, Department of Materials Science and Engineering, Stanford University (2022)
- William D. Nix Award, TMS, The Mining, Metals, and Materials Society, Warrendale, PA (2020)
- Monie A. Ferst Award, Sigma Xi (2017)
- Honorary Doctorate of Science, Northwestern University (2012)
- Fellow, Materials Research Society (2011)
- Heyn Medal, German Society of Materials Science (2011)
- Honorary Doctorate of Engineering, University of Illinois, Urbana-Champaign (2007)
- Von Hippel Award, Materials Research Society (2007)
- Albert Sauveur Achievement Award, ASM International (2003)
- Member, National Academy of Sciences (2003)
- A.E. White Distinguished Teacher Award, ASM International (2002)

- Fellow, American Academy of Arts and Sciences (2002)
- Honorary Doctorate of Engineering, Colorado School of Mines (2001)
- Nadai Medal, ASME (2001)
- ASM Gold Medal, ASM International (1998)
- The Metallurgical Society, Educator Award (1995)
- Acta Metallurgica, Gold Medal (1993)
- Member, National Academy of Engineering (1987)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, National Academy of Sciences (2013 - present)
- Member, National Academy of Engineering (2013 - present)
- Member, American Academy of Arts and Sciences (2013 - present)

PROFESSIONAL EDUCATION

- PhD, Stanford University (1963)

Publications

PUBLICATIONS

- **Ultrasensitive measurement of brain penetration mechanics and blood vessel rupture with microscale probes.** *Proceedings of the National Academy of Sciences of the United States of America*
  Obaid, A., Hanna, M. E., Huang, S. W., Hu, Y. T., Jáidar, O., Nix, W., Ding, J. B., Melosh, N. A., Wu, Y. W.
  2026; 123 (13): e2529147123

- **Theory of Dislocations, Third Edition (Book Review)** *JOURNAL OF APPLIED MECHANICS-TRANSACTIONS OF THE ASME*
  Book Review Authored by: Nix, W. D.
  2022; 89 (3)

- **Impact of Lorentz Force On Atomic Flux During Electromigration**
  Morusupalli, R. R., Littlefield, D. L., Nix, W. D., IEEE
  IEEE.2021: 82-85

- **Intrinsic size dependent plasticity in BCC micro-pillars under uniaxial tension and pure torsion** *EXTREME MECHANICS LETTERS*
  Ryu, I., Gravell, J. D., Cai, W., Nix, W. D., Gao, H.
  2020; 40

- **Radiation-damage in multi-layered zircon: Mechanical properties** *APPLIED PHYSICS LETTERS*
  Beirau, T., Oliver, W. C., Reissner, C. E., Nix, W. D., Poellmann, H., Ewing, R. C.
  2019; 115 (8)

- **High-Throughput Growth of Microscale Gold Bicrystals for Single-Grain-Boundary Studies.** *Advanced materials (Deerfield Beach, Fla.)*
  Gan, L. T., Yang, R. n., Traylor, R. n., Cai, W. n., Nix, W. D., Fan, J. A.
  2019: e1902189

- **Radiation-damage-induced transitions in zircon: Percolation theory applied to hardness and elastic moduli as a function of density** *APPLIED PHYSICS LETTERS*
  Beirau, T., Nix, W. D., Ewing, R. C., Poellmann, H., Salje, E. K. H.
  2018; 112 (20)

- **Radiation-induced effects on the mechanical properties of natural ZrSiO4: double cascade-overlap damage accumulation** *PHYSICS AND CHEMISTRY OF MINERALS*
  Beirau, T., Nix, W. D., Poellmann, H., Ewing, R. C.
  2018; 45 (5): 435–42

- **A simple model for indentation creep** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Ginder, R. S., Nix, W. D., Pharr, G. M.
  2018; 112: 552–62
- **Single-crystal metal growth on amorphous insulating substrates** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Zhang, K., Pitner, X., Yang, R., Nix, W. D., Plummer, J. D., Fan, J. A.
  2018; 115 (4): 685–89
- **Ultrathin Films.** *ACS nano*
  Shi, Y., Lee, S. C., Monti, M., Wang, C., Feng, Z. A., Nix, W. D., Toney, M. F., Sinclair, R., Chueh, W. C.
  2016; 10 (11): 9938-9947
- **Growth of Highly Strained CeO2 Ultrathin Films** *ACS NANO*
  Shi, Y., Lee, S. C., Monti, M., Wang, C., Feng, Z. A., Nix, W. D., Toney, M. F., Sinclair, R., Chueh, W. C.
  2016; 10 (11): 9938-9947
- **Anisotropic mechanical properties of zircon and the effect of radiation damage** *PHYSICS AND CHEMISTRY OF MINERALS*
  Beirau, T., Nix, W. D., Bismayer, U., Boatner, L. A., Isaacson, S. G., Ewing, R. C.
  2016; 43 (9): 627-638
- **Anisotropic Size-Dependent Plasticity in Face-Centered Cubic Micropillars Under Torsion** *JOM*
  Ryu, I., Cai, W., Nix, W. D., Gao, H.
  2016; 68 (1): 253-260
- **Mechanical properties of natural radiation-damaged titanite and temperature-induced structural reorganization: A nanoindentation and Raman spectroscopic study** *AMERICAN MINERALOGIST*
  Beirau, T., Nix, W. D., Ewing, R. C., Schneider, G. A., Groats, L. A., Bismayer, U.
  2016; 101 (1-2): 399-406
- **Imperfections in Crystalline Solids Preface** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: XI-+
- **Statistical thermodynamics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 48–67
- **Stress, strain, and isotropic elasticity** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 21–47
- **POINT DEFECTS** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 69
- **Point defect thermodynamics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 101–39
- **Point defect mechanics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 71–100
- **Point defect kinetics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 175–206
- **Dislocation core structure** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.

2016: 395–430

- **Imperfections in Crystalline Solids Introduction** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 1–17
- **Point defect equilibria** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 140–74
- **Partial and extended dislocations** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 348–94
- **Dislocation mechanics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 244–82
- **DISLOCATIONS** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 207
- **Dislocation interactions and applications** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 283–347
- **Dislocation geometry** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 209–43
- **Grain boundary geometry** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 433–54
- **Grain boundary mechanics** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 455–87
- **King table for solid solutions** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 488–96
- **Thermoelastic properties of common crystalline solids** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 497–98
- **Thermodynamic and kinetic properties of vacancies** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 499–500
- **Diffusion coefficients in common crystals** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 501–6
- **GRAIN BOUNDARIES** *IMPERFECTIONS IN CRYSTALLINE SOLIDS*
  Cai, W., Nix, W. D., Cai, W., Nix, W.
  2016: 431
- **Stochastic behaviors in plastic deformation of face-centered cubic micropillars governed by surface nucleation and truncated source operation** *ACTA MATERIALIA*
  Ryu, I., Cai, W., Nix, W. D., Gao, H.

2015; 95: 176-183

- **Kinetics and fracture resistance of lithiated silicon nanostructure pairs controlled by their mechanical interaction** *NATURE COMMUNICATIONS*
  Lee, S. W., Lee, H., Ryu, I., Nix, W. D., Gao, H., Cui, Y.
  2015; 6
- **Fracture of crystalline germanium during electrochemical lithium insertion** *EXTREME MECHANICS LETTERS*
  Lee, S., Ryu, I., Nix, W. D., Cui, Y.
  2015; 2: 15–19
- **Instrumented nanoindentation and 3D mechanistic modeling of a shale at multiple scales** *ACTA GEOTECHNICA*
  Bennett, K. C., Berla, L. A., Nix, W. D., Borja, R. I.
  2015; 10 (1): 1-14
- **Mechanical behavior of electrochemically lithiated silicon** *JOURNAL OF POWER SOURCES*
  Berla, L. A., Lee, S. W., Cui, Y., Nix, W. D.
  2015; 273: 41-51
- **Kinetics and fracture resistance of lithiated silicon nanostructure pairs controlled by their mechanical interaction.** *Nature communications*
  Lee, S. W., Lee, H., Ryu, I., Nix, W. D., Gao, H., Cui, Y.
  2015; 6: 7533-?
- **Robustness of amorphous silicon during the initial lithiation/delithiation cycle** *JOURNAL OF POWER SOURCES*
  Berla, L. A., Lee, S. W., Ryu, I., Cui, Y., Nix, W. D.
  2014; 258: 253-259
- **Microscopic model for fracture of crystalline Si nanopillars during lithiation** *JOURNAL OF POWER SOURCES*
  Ryu, I., Lee, S. W., Gao, H., Cui, Y., Nix, W. D.
  2014; 255: 274-282
- **Modeling a distribution of point defects as misfitting inclusions in stressed solids** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Cai, W., Sills, R. B., Barnett, D. M., Nix, W. D.
  2014; 66: 154-171
- **A LABORATORY EXPERIMENT USING NANOINDENTATION TO DEMONSTRATE THE INDENTATION SIZE EFFECT** *JOURNAL OF MATERIALS EDUCATION*
  Wright, W. J., Feng, G., Nix, W. D.
  2013; 35 (5-6): 135-143
- **25th Anniversary Article: Understanding the Lithiation of Silicon and Other Alloying Anodes for Lithium-Ion Batteries** *ADVANCED MATERIALS*
  McDowell, M. T., Lee, S. W., Nix, W. D., Cui, Y.
  2013; 25 (36): 4966-4984
- **Plasticity of bcc micropillars controlled by competition between dislocation multiplication and depletion** *ACTA MATERIALIA*
  Ryu, I., Nix, W. D., Cai, W.
  2013; 61 (9): 3233-3241
- **In Situ TEM of Two-Phase Lithiation of Amorphous Silicon Nanospheres** *NANO LETTERS*
  McDowell, M. T., Lee, S. W., Harris, J. T., Korgel, B. A., Wang, C., Nix, W. D., Cui, Y.
  2013; 13 (2): 758-764
- **Critical-temperature/Peierls-stress dependent size effects in body centered cubic nanopillars** *APPLIED PHYSICS LETTERS*
  Han, S. M., Feng, G., Jung, J. Y., Jung, H. J., Groves, J. R., Nix, W. D., Cui, Y.
  2013; 102 (4)
- **Reaction Front Evolution during Electrochemical Lithiation of Crystalline Silicon Nanopillars** *ISRAEL JOURNAL OF CHEMISTRY*
  Lee, S. W., Berla, L. A., McDowell, M. T., Nix, W. D., Cui, Y.
  2012; 52 (11-12): 1118-1123

- **Studying the Kinetics of Crystalline Silicon Nanoparticle Lithiation with In Situ Transmission Electron Microscopy** *ADVANCED MATERIALS*
  McDowell, M. T., Ryu, I., Lee, S. W., Wang, C., Nix, W. D., Cui, Y.
  2012; 24 (45): 6034-?
- **Fracture of crystalline silicon nanopillars during electrochemical lithium insertion** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Lee, S. W., McDowell, M. T., Berla, L. A., Nix, W. D., Cui, Y.
  2012; 109 (11): 4080-4085
- **Size dependence of the yield strength of fcc and bcc metallic micropillars with diameters of a few micrometers** *PHILOSOPHICAL MAGAZINE*
  Lee, S., Nix, W. D.
  2012; 92 (10): 1238-1260
- **Size-dependent fracture of Si nanowire battery anodes** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Ryu, I., Choi, J. W., Cui, Y., Nix, W. D.
  2011; 59 (9): 1717-1730
- **Novel Size and Surface Oxide Effects in Silicon Nanowires as Lithium Battery Anodes** *NANO LETTERS*
  McDowell, M. T., Lee, S. W., Ryu, I., Wu, H., Nix, W. D., Choi, J. W., Cui, Y.
  2011; 11 (9): 4018-4025
- **Size effect in compression of single-crystal gold microparticles** *ACTA MATERIALIA*
  Mordehai, D., Lee, S., Backes, B., Srolovitz, D. J., Nix, W. D., Rabkin, E.
  2011; 59 (13): 5202-5215
- **Effects of focused-ion-beam irradiation and prestraining on the mechanical properties of FCC Au microparticles on a sapphire substrate** *JOURNAL OF MATERIALS RESEARCH*
  Lee, S., Mordehai, D., Rabkin, E., Nix, W. D.
  2011; 26 (14): 1653-1661
- **Interconnected Silicon Hollow Nanospheres for Lithium-Ion Battery Anodes with Long Cycle Life** *NANO LETTERS*
  Yao, Y., McDowell, M. T., Ryu, I., Wu, H., Liu, N., Hu, L., Nix, W. D., Cui, Y.
  2011; 11 (7): 2949-2954
- **Dislocation junctions and jogs in a free-standing FCC thin film** *MODELLING AND SIMULATION IN MATERIALS SCIENCE AND ENGINEERING*
  Lee, S., Aubry, S., Nix, W. D., Cai, W.
  2011; 19 (2)
- **Extracting thin film hardness of extremely compliant films on stiff substrates** *THIN SOLID FILMS*
  Han, S. M., Guyer, E. P., Nix, W. D.
  2011; 519 (10): 3221-3224
- **BEYOND THE LAB Develop and follow your own passion** *MRS BULLETIN*
  Nix, W. D.
  2011; 36 (1): 14-15
- **Micro-pillar plasticity controlled by dislocation nucleation at surfaces** *PHILOSOPHICAL MAGAZINE*
  Nix, W. D., Lee, S.
  2011; 91 (7-9): 1084-1096
- **Size effects on strength and plasticity of vanadium nanopillars** *SCRIPTA MATERIALIA*
  Han, S. M., Bozorg-Grayeli, T., Groyes, J. R., Nix, W. D.
  2010; 63 (12): 1153-1156
- **Electromigration-Induced Plastic Deformation in Cu Interconnects: Effects on Current Density Exponent, n, and Implications for EM Reliability Assessment** *Symposium on Phase Stability, Phase Transformation and Reactive Phase Formation in Electronic Materials VII*
  Budiman, A. S., Hau-Riege, C. S., Baek, W. C., Lor, C., Huang, A., Kim, H. S., Neubauer, G., Pak, J., Besser, P. R., Nix, W. D.
  SPRINGER.2010: 2483–88

- **What is the Young's Modulus of Silicon?** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*
  Hopcroft, M. A., Nix, W. D., Kenny, T. W.
  2010; 19 (2): 229-238
- **A physically based model for indenter tip shape calibration for nanoindentation** *JOURNAL OF MATERIALS RESEARCH*
  Berla, L. A., Allen, A. M., Han, S. M., Nix, W. D.
  2010; 25 (4): 735-745
- **Geometrical analysis of 3D dislocation dynamics simulations of FCC micro-pillar plasticity** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Lee, S., Nix, W. D.
  2010; 527 (7-8): 1903-1910
- **Modelling dislocations in a free-standing thin film** *MODELLING AND SIMULATION IN MATERIALS SCIENCE AND ENGINEERING*
  Weinberger, C. R., Aubry, S., Lee, S., Nix, W. D., Cai, W.
  2009; 17 (7)
- **Study of strain softening behavior of Al-Al3Sc multilayers using microcompression testing** *ACTA MATERIALIA*
  Han, S. M., Phillips, M. A., Nix, W. D.
  2009; 57 (15): 4473-4490
- **Uniaxial compression of fcc Au nanopillars on an MgO substrate: The effects of prestraining and annealing** *ACTA MATERIALIA*
  Lee, S., Han, S. M., Nix, W. D.
  2009; 57 (15): 4404-4415
- **Electromigration-Induced Plasticity: Texture Correlation and Implications for Reliability Assessment** *JOURNAL OF ELECTRONIC MATERIALS*
  Budiman, A. S., Besser, P. R., Hau-Riege, C. S., Marathe, A., Joo, Y., Tamura, N., Patel, J. R., Nix, W. D.
  2009; 38 (3): 379-391
- **A quantitative analysis for the stress field around an elastoplastic indentation/contact** *SPEM Research Conference on the Sedimentary Record of Meteorite Impacts*
  Feng, G., Qu, S., Huang, Y., Nix, W. D.
  CAMBRIDGE UNIV PRESS.2009: 704–18
- **Microstructure Effect on EM-Induced Degradations in Dual Inlaid Copper Interconnects** *IEEE TRANSACTIONS ON DEVICE AND MATERIALS RELIABILITY*
  Sukharev, V., Kteyan, A., Zschech, E., Nix, W. D.
  2009; 9 (1): 87-97
- **Storage and loss stiffnesses and moduli as determined by dynamic nanoindentation** *SPEM Research Conference on the Sedimentary Record of Meteorite Impacts*
  Wright, W. J., Nix, W. D.
  CAMBRIDGE UNIV PRESS.2009: 863–71
- **Exploiting New Opportunities in Materials Research by Remembering and Applying Old Lessons** *MRS BULLETIN*
  Nix, W. D.
  2009; 34 (2): 82-91
- **Yielding and Strain Hardening in Metallic Thin Films on Substrates: an Edge Dislocation Climb Model** *MATHEMATICS AND MECHANICS OF SOLIDS*
  Nix, W. D.
  2009; 14 (1-2): 207-219
- **Indentation size effects in single crystal copper as revealed by synchrotron x-ray microdiffraction** *JOURNAL OF APPLIED PHYSICS*
  Feng, G., Budiman, A. S., Nix, W. D., Tamura, N., Patel, J. R.
  2008; 104 (4)
- **A model for power law creep controlled hillock growth** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Berla, L. A., Joo, Y., Nix, W. D.

2008; 488 (1-2): 594-600

- **Formation of chiral branched nanowires by the Eshelby Twist** *NATURE NANOTECHNOLOGY*
  Zhu, J., Peng, H., Marshall, A. F., Barnett, D. M., Nix, W. D., Cui, Y.
  2008; 3 (8): 477-481
- **Nanoscale deformation - Seeing is believing** *NATURE MATERIALS*
  Hemker, K. J., Nix, W. D.
  2008; 7 (2): 97-98
- **A search for evidence of strain gradient hardening in Au submicron pillars under uniaxial compression using synchrotron X-ray micro diffraction** *ACTA MATERIALIA*
  Budiman, A. S., Han, S. M., Greer, J. R., Tamura, N., Patel, J. R., Nix, W. D.
  2008; 56 (3): 602-608
- **Size dependence in mechanical properties of gold at the micron scale in the absence of strain gradients** *APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING*
  Greer, J. R., Nix, W. D.
  2008; 90 (1): 203-203
- **A model for electromigration-induced degradation mechanisms in dual-inlaid copper interconnects: Effect of microstructure** *JOURNAL OF APPLIED PHYSICS*
  Sukharev, V., Zschech, E., Nix, W. D.
  2007; 102 (5)
- **A model for hillock growth in Al thin films controlled by plastic deformation** *ACTA MATERIALIA*
  Hwang, S., Nix, W. D., Joo, Y.
  2007; 55 (15): 5297-5301
- **An analytical expression for the stress field around an elastoplastic indentation/contact** *ACTA MATERIALIA*
  Feng, G., Qu, S., Huang, Y., Nix, W. D.
  2007; 55 (9): 2929-2938
- **In-situ observation of electromigration in eutectic SnPb solder lines: Atomic migration and hillock formation** *JOURNAL OF ELECTRONIC MATERIALS*
  Yoon, M., Ko, M., Kim, O., Park, Y., Nix, W. D., Joo, Y.
  2007; 36 (5): 562-567
- **Deformation at the nanometer and micrometer length scales: Effects of strain gradients and dislocation starvation** *Symposium on Mechanical Behavior of Thin Films and Small Structures held at the 2005 TMS Annual Meeting*
  Nix, W. D., Greer, J. R., Feng, G., Lilleodden, E. T.
  ELSEVIER SCIENCE SA.2007: 3152–57
- **An improved analysis for viscoelastic damping in dynamic nanoindentation** *INTERNATIONAL JOURNAL OF SURFACE SCIENCE AND ENGINEERING*
  Wright, W. J., Maloney, A. R., Nix, W. D.
  2007; 1 (2-3): 274-292
- **Microstructure effect on EM-induced degradations in dual-inlaid copper interconnects** *9th International Workshop on Stress-Induced Phenomena in Metallization*
  Kteyan, A., Sukharev, V., Meyer, M., Zschech, E., Nix, W. D.
  AMER INST PHYSICS.2007: 42–55
- **Plasticity-amplified diffusivity: Dislocation cores as fast drffusion paths in cu interconnects** *45th Annual IEEE International Reliability Physics Symposium*
  Budiman, A. S., Hau-Riege, C. S., Besser, P. R., Marathe, A., Joo, Y., Tamura, N., Patel, J. R., Nix, W. D.
  IEEE.2007: 122–127
- **Electromigration-induced plasticity and texture in Cu interconnects** *9th International Workshop on Stress-Induced Phenomena in Metallization*
  Budiman, A. S., Hau-Riege, C. S., Besser, P. R., Marathe, A., Joo, Y. C., Tamura, N., Patel, J. R., Nix, W. D.
  AMER INST PHYSICS.2007: 56–65

- **Indentation of a hard film on a soft substrate: Strain gradient hardening effects** *INTERNATIONAL JOURNAL OF PLASTICITY*
  Zhang, F., Saha, R., Huang, Y., Nix, W. D., Hwang, K. C., Qu, S., Li, M.
  2007; 23 (1): 25-43
- **Comparison of Line stress predictions with measured electromigration failure times** *IEEE International Integrated Reliability Workshop*
  Morusupalli, R. R., Nix, W. D., Patel, J. R.
  IEEE.2007: 124–127
- **Single layer mesoporous silica thin films as templates for metallic nanoscale arrays** *JOURNAL OF APPLIED PHYSICS*
  Hussen, G. N., Shirakawa, H., Nix, W. D., Clemens, B. M.
  2006; 100 (11)
- **Size effect in contact compression of nano- and microscale pyramid structures** *ACTA MATERIALIA*
  Wang, J., Lian, J., Greer, J. R., Nix, W. D., Kim, K.
  2006; 54 (15): 3973-3982
- **A model of size effects in nano-indentation** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Huang, Y., Zhang, F., Hwang, K. C., Nix, W. D., Pharr, G. M., Feng, G.
  2006; 54 (8): 1668-1686
- **Crystal plasticity in Cu damascene interconnect lines undergoing electromigration as revealed by synchrotron x-ray microdiffraction** *APPLIED PHYSICS LETTERS*
  Budiman, A. S., Nix, W. D., Tamura, N., Valek, B. C., Gadre, K., Maiz, J., Spolenak, R., Patel, J. R.
  2006; 88 (23)
- **Nanoscale gold pillars strengthened through dislocation starvation** *PHYSICAL REVIEW B*
  Greer, J. R., Nix, W. D.
  2006; 73 (24)
- **A study of the mechanical properties of nanowires using nanoindentation** *JOURNAL OF APPLIED PHYSICS*
  Feng, G., Nix, W. D., Yoon, Y., Lee, C. J.
  2006; 99 (7)
- **Microstructural length-scale effects in the nanoindentation behavior of thin gold films** *ACTA MATERIALIA*
  Lilleodden, E. T., Nix, W. D.
  2006; 54 (6): 1583-1593
- **Determining hardness of thin films in elastically mismatched film-on-substrate systems using nanoindentation** *ACTA MATERIALIA*
  Han, S. M., Saha, R., Nix, W. D.
  2006; 54 (6): 1571-1581
- **Size dependence in mechanical properties of gold at the micron scale in the absence of strain gradients (vol 53, pg 1821, 2005)** *ACTA MATERIALIA*
  Greer, J. R., OLIVER, W. C., Nix, W. D.
  2006; 54 (6): 1705-1705
- **Anelastic behavior of copper thin films on silicon substrates: Damping associated with dislocations** *ACTA MATERIALIA*
  Choi, D. H., Nix, W. D.
  2006; 54 (3): 679-687
- **Electromigration-induced plastic deformation in Cu damascene interconnect lines as revealed by Synchrotron X-Ray Microdiffraction** *Symposium on Materials, Technology and Reliability of Low-k Dielectrics and Copper Interconnects held at the 2006 MRS Spring Meeting*
  Budiman, A. S., Tamura, N., Valek, B. C., Gadre, K., Maiz, J., Spolenak, R., Patel, J. R., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2006: 295–304
- **Mechanism-based strain gradient crystal plasticity** *IUTAM Symposium on Size Effects on Material and Structural Behavior at Micron- and Nano-Scales*
  Han, C., Gao, H., Huang, Y., Nix, W. D.
  SPRINGER.2006: 163–171

- **Remarks** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Nix, W. D.
  2005; 409 (1-2): 5-6
- **Mechanism-based strain gradient crystal plasticity - II. Analysis** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Han, C. S., Gao, H. J., Huang, Y. G., Nix, W. D.
  2005; 53 (5): 1204-1222
- **Size dependence of mechanical properties of gold at the sub-micron scale** *APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING*
  Greer, J. R., Nix, W. D.
  2005; 80 (8): 1625-1629
- **Mechanism-based strain gradient crystal plasticity - I. Theory** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Han, C. S., Gao, H. J., Huang, Y. G., Nix, W. D.
  2005; 53 (5): 1188-1203
- **Combinatorial studies of mechanical properties of Ti-Al thin films using nanoindentation** *ACTA MATERIALIA*
  Han, S. M., Shah, R., Banerjee, R., Viswanathan, G. B., Clemens, B. M., Nix, W. D.
  2005; 53 (7): 2059-2067
- **Size dependence of mechanical properties of gold at the micron scale in the absence of strain gradients** *ACTA MATERIALIA*
  Greer, J. R., OLIVER, W. C., Nix, W. D.
  2005; 53 (6): 1821-1830
- **A microbeam bending method for studying stress-strain relations for metal thin films on silicon substrates** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Florando, J. N., Nix, W. D.
  2005; 53 (3): 619-638
- **Critical thickness enhancement of epitaxial SiGe films grown on small structures** *JOURNAL OF APPLIED PHYSICS*
  Liang, Y., Nix, W. D., Griffin, P. B., Plummer, J. D.
  2005; 97 (4)
- **Misfit dislocation dissociation and Lomer formation in low mismatch SiGe/Si heterostructures** *JOURNAL OF MATERIALS RESEARCH*
  Marshall, A. F., Aubertine, D. B., Nix, W. D., McIntyre, P. C.
  2005; 20 (2): 447-455
- **Comparison of the telephone cord delamination method for measuring interfacial adhesion with the four-point bending method** *ACTA MATERIALIA*
  Lee, A., Litteken, C. S., Dauskardt, R. H., Nix, W. D.
  2005; 53 (3): 609-616
- **Comparison of line stress predictions with measured electromigration failure times** *11th Symposium on Thin Film - Stresses and Mechanical Properties held at the MRS Spring Meeting*
  Morusupalli, R. R., Nix, W. D., Patel, J. R., Budiman, A. S.
  MATERIALS RESEARCH SOCIETY.2005: 313–318
- **Comparison of line Stress predictions with measured electromigration failure times** *Symposium on Materials, Technology and Reliability of Advanced Interconnects held at the 2005 MRS Spring Meeting*
  Morusupalli, R. R., Nix, W. D., Patel, J. R., Budiman, A. S.
  MATERIALS RESEARCH SOCIETY.2005: 253–258
- **Indenter tip radius effect on the Nix-Gao relation in micro- and nanoindentation hardness experiments** *JOURNAL OF MATERIALS RESEARCH*
  Qu, S., Huang, Y., Nix, W. D., Jiang, H., Zhang, F., Hwang, K. C.
  2004; 19 (11): 3423-3434
- **Quantitative impedance measurement using atomic force microscopy** *JOURNAL OF APPLIED PHYSICS*
  O'Hayre, R., Feng, G., Nix, W. D., Prinz, F. B.
  2004; 96 (6): 3540-3549

- **Studies of the driving force for room-temperature microstructure evolution in electroplated copper films** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B*
  Lee, H., Nix, W. D., Wong, S. S.
  2004; 22 (5): 2369-2374
- **Indentation size effect in MgO** *SCRIPTA MATERIALIA*
  Feng, G., Nix, W. D.
  2004; 51 (6): 599-603
- **Sample dimensions influence strength and crystal plasticity** *SCIENCE*
  Uchic, M. D., Dimiduk, D. M., Florando, J. N., Nix, W. D.
  2004; 305 (5686): 986-989
- **Shear band spacing under bending of Zr-based metallic glass plates** *ACTA MATERIALIA*
  Conner, R. D., Li, Y., Nix, W. D., Johnson, W. L.
  2004; 52 (8): 2429-2434
- **Stress induced delamination methods for the study of adhesion of Pt thin films to Si** *ACTA MATERIALIA*
  Lee, A., Clemens, B. M., Nix, W. D.
  2004; 52 (7): 2081-2093
- **Anelasticity and damping of thin aluminum films on silicon substrates** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*
  Choi, D. H., Kim, H., Nix, W. D.
  2004; 13 (2): 230-237
- **Coherency and surface stress effects in metal multilayers** *SCRIPTA MATERIALIA*
  Ramaswamy, V., Nix, W. D., Clemens, B. M.
  2004; 50 (6): 711-715
- **Mechanical property measurements of pure Ni, Ni3Al, and Ni-base superalloys at the micron-size scale** *5th Global Innovations Symposium held at the 2004 TMS Annual Meeting*
  Uchic, M. D., Dimiduk, D. M., Seekely, M. J., Florando, J. N., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.2004: 321–321
- **Mechanism-based strain gradient crystal plasticity** *NANOSCALE MATERIALS AND MODELING-RELATIONS AMONG PROCESSING, MICROSTRUCTURE AND MECHANICAL PROPERTIES*
  Han, C. S., Gao, H. J., Huang, Y. G., Nix, W. D.
  2004; 821: 301-306
- **Some challenges in understanding. mechanical properties at the nanometer and micrometer length scales** *5th Global Innovations Symposium held at the 2004 TMS Annual Meeting*
  Nix, W. D., Gang, F., Greer, J. R.
  MINERALS, METALS & MATERIALS SOC.2004: 273–273
- **Unexpected mode of plastic deformation in Cu damascene lines undergoing electromigration** *Synposium on Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics held at the 2004 MRS Spring Meeting*
  Budiman, A. S., Tamura, N., Valek, B. C., Gadre, K., Maiz, J., Spolenak, R., Caldwell, W. A., Nix, W. D., Patel, J. R.
  MATERIALS RESEARCH SOCIETY.2004: 345–350
- **The prospects for mechanical ratcheting of bulk metallic glasses** *Symposium on Amorphous and Nanocrystalline Metals held at the 2003 MRS Fall Meeting*
  Wright, W. J., Dauskardt, R. H., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2004: 319–324
- **Early stage of plastic deformation in thin films undergoing electromigration** *JOURNAL OF APPLIED PHYSICS*
  Valek, B. C., Tamura, N., Spolenak, R., Caldwell, W. A., MacDowell, A. A., Celestre, R. S., Padmore, H. A., Braman, J. C., Batterman, B. W., Nix, W. D., Patel, J. R.
  2003; 94 (6): 3757-3761
- **Self-assembled nanostructures through wavelength-controlled spinodal decomposition** *APPLIED PHYSICS LETTERS*
  Greaney, P. A., Chrzan, D. C., Clemens, B. M., Nix, W. D.

2003; 83 (7): 1364-1366

- **Shear bands and cracking of metallic glass plates in bending** *JOURNAL OF APPLIED PHYSICS*
  Conner, R. D., Johnson, W. L., Paton, N. E., Nix, W. D.
  2003; 94 (2): 904-911
- **Microstructure and nanoindentation hardness of Al/Al3Sc multilayers** *ACTA MATERIALIA*
  Phillips, M. A., Clemens, B. M., Nix, W. D.
  2003; 51 (11): 3171-3184
- **A model for dislocation behavior during deformation of Al/Al3SC (fcc/L1(2))metallic multilayers** *ACTA MATERIALIA*
  Phillips, M. A., Clemens, B. M., Nix, W. D.
  2003; 51 (11): 3157-3170
- **Atomistic simulations of elastic deformation and dislocation nucleation during nanoindentation** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Lilleodden, E. T., Zimmerman, J. A., Foiles, S. M., Nix, W. D.
  2003; 51 (5): 901-920
- **Surface diffusion and growth of patterned nanostructures on strained surfaces** *PHYSICAL REVIEW B*
  Sabiryanov, R. F., Larsson, M. I., Cho, K. J., Nix, W. D., Clemens, B. M.
  2003; 67 (12)
- **Growth and properties of small Co islands on a strained Pt surface** *2nd Moscow International Symposium on Magnetism (MISM 2001)*
  Sabiryanov, R. F., Cho, K., Larsson, M. I., Nix, W. D., Clemens, B. M.
  ELSEVIER SCIENCE BV.2003: 365–368
- **Free volume coalescence and void formation in shear bands in metallic glass** *JOURNAL OF APPLIED PHYSICS*
  Wright, W. J., Hufnagel, T. C., Nix, W. D.
  2003; 93 (3): 1432-1437
- **Exploring specimen size effects in plastic deformation of Ni-3(Al, Ta)** *Symposium on Defect Properties and Related Phenomena in Intermetallic Alloys held at the 2002 MRS Fall Meeting*
  Uchic, M. D., Dimiduk, D. M., Florando, J. N., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2003: 27–32
- **Mechanical properties of Al/Al3SC metallic multilayers - deformation mechanisms at the nanoscale** *4th International Conference on Processing and Manufacturing of Advanced Materials*
  Phillips, M. A., Clemens, B. M., Nix, W. D.
  TRANS TECH PUBLICATIONS LTD.2003: 3373–3378
- **Identification of elastic-plastic material parameters from pyramidal indentation of thin films** *PROCEEDINGS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*
  Huber, N., Nix, W. D., Gao, H.
  2002; 458 (2023): 1593-1620
- **Confined capillary stresses during the initial growth of thin films on amorphous substrates** *JOURNAL OF APPLIED MECHANICS-TRANSACTIONS OF THE ASME*
  Gill, S. P., Gao, H., Ramaswamy, V., Nix, W. D.
  2002; 69 (4): 425-432
- **Inhomogeneous deformation in metallic glasses** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Huang, R., Suo, Z., Prevost, J. H., Nix, W. D.
  2002; 50 (5): 1011-1027
- **Effects of the substrate on the determination of thin film mechanical properties by nanoindentation** *ACTA MATERIALIA*
  Saha, R., Nix, W. D.
  2002; 50 (1): 23-38
- **Kinetic Monte Carlo simulations of strain-induced nanopatterning on hexagonal surfaces** *Symposium on Modeling and Numerical Simulation of Materials Behavior and Evolution held at the 2002 MRS Spring Meeting*

Larsson, M. I., Lee, B., Sabiryanov, R., Cho, K., Nix, W., Clemens, B. M.
MATERIALS RESEARCH SOCIETY.2002: 269–274

- **High strength nanoscale Al/Al3Sc multilayers formed by interface reaction** *Symposium on Nanostructured Interfaces held at the 2002 MRS Spring Meeting*
  Phillips, M. A., Clemens, B. M., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2002: 65–70
- **Sigmoidal creep of Ni-3(Al, Ta)** *INTERMETALLICS*
  Uchic, M. D., Nix, W. D.
  2001; 9 (12): 1053-1061
- **Microstructural mechanical properties and yield point effects in Mo alloys** *12th International Conference on the Strength of Materials (ICSMA 12)*
  Goken, M., Sakidja, R., Nix, W. D., Perepezko, J. H.
  ELSEVIER SCIENCE SA.2001: 902–908
- **Soft films on hard substrates - nanoindentation of tungsten films on sapphire substrates** *12th International Conference on the Strength of Materials (ICSMA 12)*
  Saha, R., Nix, W. D.
  ELSEVIER SCIENCE SA.2001: 898–901
- **Observation of the strengthening of Pt layers in Ni/Pt and Pd/Pt multilayers by in-situ substrate curvature measurement** *12th International Conference on the Strength of Materials (ICSMA 12)*
  Ramaswamy, V., Phillips, M. A., Nix, W. D., Clemens, B. M.
  ELSEVIER SCIENCE SA.2001: 887–892
- **Localized heating during serrated plastic flow in bulk metallic glasses** *12th International Conference on the Strength of Materials (ICSMA 12)*
  Wright, W. J., Schwarz, R. B., Nix, W. D.
  ELSEVIER SCIENCE SA.2001: 229–232
- **Special issue - 12th International Conference on the Strength of Materials - ICSMA-12 - Preface** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Mills, M. J., Fraser, H. L., Mukherjee, A. K., Nix, W. D., Schwarz, R. B.
  2001; 319: XVII-XVII
- **Effect of intrinsic lattice resistance in strain gradient plasticity** *ACTA MATERIALIA*
  Qiu, X., Huang, Y., Nix, W. D., Hwang, K. C., Gao, H.
  2001; 49 (19): 3949-3958
- **Primary creep of Ni-3(Al, Ta) in the anomalous flow regime** *Symposium on Deformation and Microstructure in Intermetallics*
  Uchic, M. D., Chrzan, D. C., Nix, W. D.
  ELSEVIER SCI LTD.2001: 963–69
- **Indentation of a soft metal film on a hard substrate: strain gradient hardening effects** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Saha, R., Xue, Z. Y., Huang, Y., Nix, W. D.
  2001; 49 (9): 1997-2014
- **Comparison of mechanical properties of Ni3Al thin films in disordered FCC and ordered L1(2) phases** *ACTA MATERIALIA*
  Huang, Y., Aziz, M. J., Hutchinson, J. W., Evans, A. G., Saha, R., Nix, W. D.
  2001; 49 (14): 2853-2861
- **Study of the effect of grain boundary migration on hillock formation in Al thin films** *JOURNAL OF APPLIED PHYSICS*
  Kim, D. K., Nix, W. D., Vinci, R. P., Deal, M. D., Plummer, J. D.
  2001; 90 (2): 781-788
- **Deformation mechanisms of the Zr40Ti14Ni10Cu12Be24 bulk metallic glass** *Bulk Metallic Glasses Conference*
  Wright, W. J., Saha, R., Nix, W. D.
  JAPAN INST METALS.2001: 642–49

- **Hardness and modulus of the lamellar microstructure in PST-TiAl studied by nanoindentations and AFM** *ACTA MATERIALIA*
  Goken, M., Kempf, M., Nix, W. D.
  2001; 49 (5): 903-911
- **Low force electrical contact measurements using piezoresistive MEMS cantilevers to characterize thin-film metallization** *11th International Conference on Solid-State Sensors and Actuators*
  Pruitt, B., Choi, D. H., Florando, J., Martens, R., Wenzel, S., Reynolds, C., Nix, W., Kenny, T.
  SPRINGER-VERLAG BERLIN.2001: 1032–1035
- **Role of delocalized nitrogen in determining the local atomic arrangement and mechanical properties of amorphous carbon nitride thin films** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A*
  Holloway, B. C., Kraft, O., Shuh, D. K., Nix, W. D., Kelly, M., Pianetta, P., Hagstrom, S.
  2000; 18 (6): 2964-2971
- **Stress and microstructure evolution during initial growth of Pt on amorphous substrates** *JOURNAL OF MATERIALS RESEARCH*
  Phillips, M. A., Ramaswamy, V., Clemens, B. M., Nix, W. D.
  2000; 15 (11): 2540-2546
- **A study of microindentation hardness tests by mechanism-based strain gradient plasticity** *JOURNAL OF MATERIALS RESEARCH*
  Huang, Y., Xue, Z., Gao, H., Nix, W. D., Xia, Z. C.
  2000; 15 (8): 1786-1796
- **A search for strain gradients in gold thin films on substrates using x-ray diffraction** *JOURNAL OF APPLIED PHYSICS*
  Leung, O. S., Munkholm, A., Brennan, S., Nix, W. D.
  2000; 88 (3): 1389-1396
- **Creep-controlled diffusional hillock formation in blanket aluminum thin films as a mechanism of stress relaxation** *JOURNAL OF MATERIALS RESEARCH*
  Kim, D., Nix, W. D., Deal, M. D., Plummer, J. D.
  2000; 15 (8): 1709-1718
- **Microstructure of thermal hillocks on blanket Al thin films** *THIN SOLID FILMS*
  Kim, D., Heiland, B., Nix, W. D., Arzt, E., Deal, M. D., Plummer, J. D.
  2000; 371 (1-2): 278-282
- **Critical thickness in the HgCdTe/CdZnTe system** *1999 US Workshop on the Physics and Chemistry of II-VI Materials*
  Berding, M. A., Nix, W. D., Rhiger, D. R., Sen, S., Sher, A.
  SPRINGER.2000: 676–79
- **X-ray measurements of the depth dependence of stress in gold films** *6th International Conference on X-ray and Neutron Scattering*
  Brennan, S., Munkholm, A., Leung, O. S., Nix, W. D.
  ELSEVIER SCIENCE BV.2000: 125–29
- **Surface-energy-driven intermixing and its effect on the measurement of interface stress** *JOURNAL OF APPLIED PHYSICS*
  Clemens, B. M., Nix, W. D., Ramaswamy, V.
  2000; 87 (6): 2816-2820
- **Finite element analysis of the wedge delamination test** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Schulze, M., Nix, W. D.
  2000; 37 (7): 1045-1063
- **Decrepitation Model For Capacity Loss During Cycling of Alloys in Rechargeable Electrochemical Systems** *IONICS*
  Huggins, R. A., Nix, W. D.
  2000; 6 (1-2): 57-63
- **The strain gradient effects in micro-indentation hardness experiments** *Symposium on Multiscale Phenomena in Materials-Experiments and Modeling at the 1999 MRS Fall Meeting*
  Xue, Z., Huang, Y., Gao, F., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2000: 53–58

- **Wafer curvature studies of strengthening mechanisms in thin films on substrates** *Symposium V on Thin Films-Stresses and Mechanical Properties VIII held at the 1999 MRS Fall Meeting*
  Leung, O. S., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2000: 51–56

- **Mechanisms of time-dependent plasticity in polycrystalline thin films on substrates** *Honorary Symposium for Professor Oleg D Sherby held at the 2000 TMS Annual Meeting*
  Dalbec, T. R., Leung, O. S., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.2000: 95–108

- **A model for calculating substrate curvature during coalescence of PT islands on an amorphous substrate** *Symposium on Multiscale Phenomena in Materials-Experiments and Modeling at the 1999 MRS Fall Meeting*
  Phillips, M. A., Ramaswamy, V., Clemens, B. M., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.2000: 39–44

- **Diffusional hillock formation in Al thin films controlled by creep** *Symposium V on Thin Films-Stresses and Mechanical Properties VIII held at the 1999 MRS Fall Meeting*
  Kim, D. K., Nix, W. D., Arzt, E., Deal, M. D., Plummer, J. D.
  MATERIALS RESEARCH SOCIETY.2000: 129–134

- **Mechanism-based strain gradient plasticity - II. Analysis** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Huang, Y., Gao, H., Nix, W. D., Hutchinson, J. W.
  2000; 48 (1): 99-128

- **Mechanical properties of a particle-strengthened polyurethane foam** *JOURNAL OF APPLIED POLYMER SCIENCE*
  Goods, S. H., Neuschwanger, C. L., Whinnery, L. L., Nix, W. D.
  1999; 74 (11): 2724-2736

- **Modeling plasticity at the micrometer scale** *Die Naturwissenschaften*
  Gao, H., Huang, Y., Nix, W. D.
  1999; 86 (11): 507-15

- **Modeling plasticity at the micrometer scale** *NATURWISSENSCHAFTEN*
  Gao, H., Huang, Y., Nix, W. D.
  1999; 86 (11): 507-515

- **Self-immobilization of superdislocations in L1(2) alloys: a simple statistical analysis** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  Chrzan, D. C., Uchic, M. D., Nix, W. D.
  1999; 79 (10): 2397-2412

- **Strain directed assembly of nanoparticle arrays within a semiconductor** *JOURNAL OF NANOPARTICLE RESEARCH*
  Hung, C., Marshall, A. F., Kim, D., Nix, W. D., Harris, J. S., Kiehl, R. A.
  1999; 1 (3): 329-347

- **A physically based model of electromigration and stress-induced void formation in microelectronic interconnects** *JOURNAL OF APPLIED PHYSICS*
  Gleixner, R. J., Nix, W. D.
  1999; 86 (4): 1932-1944

- **Crack-like grain-boundary diffusion wedges in thin metal films** *ACTA MATERIALIA*
  Gao, H., Zhang, L., Nix, W. D., Thompson, C. V., Arzt, E.
  1999; 47 (10): 2865-2878

- **Crystallite coalescence: A mechanism for intrinsic tensile stresses in thin films** *JOURNAL OF MATERIALS RESEARCH*
  Nix, W. D., Clemens, B. M.
  1999; 14 (8): 3467-3473

- **Stress-driven surface evolution in heteroepitaxial thin films: Anisotropy of the two-dimensional roughening mode** *JOURNAL OF MATERIALS RESEARCH*
  Ozkan, C. S., Nix, W. D., Gao, H. J.

1999; 14 (8): 3247-3256

- **Indentation plastic displacement field: Part II. The case of hard films on soft substrates** *JOURNAL OF MATERIALS RESEARCH*
  Tsui, T. Y., Vlassak, J., Nix, W. D.
  1999; 14 (6): 2204-2209
- **Mechanism-based strain gradient plasticity - I. Theory** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Gao, H., Huang, Y., Nix, W. D., Hutchinson, J. W.
  1999; 47 (6): 1239-1263
- **Indentation plastic displacement field: Part I. The case of soft films on hard substrates** *JOURNAL OF MATERIALS RESEARCH*
  Tsui, T. Y., Vlassak, J., Nix, W. D.
  1999; 14 (6): 2196-2203
- **Interpretation of x-ray photoelectron spectra of elastic amorphous carbon nitride thin films** *APPLIED PHYSICS LETTERS*
  Holloway, B. C., Kraft, O., Shuh, D. K., Kelly, M. A., Nix, W. D., Pianetta, P., Hagstrom, S.
  1999; 74 (22): 3290-3292
- **Growth and characterization of epitaxial NiMnSb/PtMnSb C1(b) Heusler alloy superlattices** *JOURNAL OF MATERIALS RESEARCH*
  Mancoff, F. B., Bobo, J. F., Richter, O. E., Bessho, K., Johnson, P. R., Sinclair, R., Nix, W. D., White, R. L., Clemens, B. M.
  1999; 14 (4): 1560-1569
- **High-temperature deformation behavior of NiAl(Ti) solid-solution single crystals** *METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Kitabjian, P. H., Garg, A., Noebe, R. D., Nix, W. D.
  1999; 30 (3): 587-600
- **Atomistic models of dislocation formation at crystal surface ledges in Si1-xGex/Si(100) heteroepitaxial thin films** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  Gao, H., Ozkan, C. S., Nix, W. D., Zimmerman, J. A., Freund, L. B.
  1999; 79 (2): 349-370
- **Surface roughening of heteroepitaxial thin films** *ANNUAL REVIEW OF MATERIALS SCIENCE*
  Gao, H. J., Nix, W. D.
  1999; 29: 173-209
- **Electromigration modeling for design rule development in microelectronic interconnects** *5th International Workshop on Stress Induced Phenomena in Metallization*
  Gleixner, R. J., MEYER, W. K., Nix, W. D.
  AIP PRESS.1999: 51–61
- **Measurement of thin film mechanical properties by microbeam bending** *Materials Reliability in Microelectronics IX Symposium at the 1999 MRS Spring Meeting*
  Florando, J., Fujimoto, H., Ma, Q., Kraft, O., Schwaiger, R., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1999: 231–236
- **An atomistic interpretation of interface stress** *SCRIPTA MATERIALIA*
  Nix, W. D., Gao, H. J.
  1998; 39 (12): 1653-1661
- **Yielding and strain hardening of thin metal films on substrates** *Symposium on Defects in Crystals Honoring John Hirth at the TMS Annual Meeting*
  Nix, W. D.
  PERGAMON-ELSEVIER SCIENCE LTD.1998: 545–54
- **Determination of indenter tip geometry and indentation contact area for depth-sensing indentation experiments** *JOURNAL OF MATERIALS RESEARCH*
  McElhaney, K. W., Vlassak, J. J., Nix, W. D.
  1998; 13 (5): 1300-1306
- **Effect of "bamboo" grain boundaries on the maximum electromigration-induced stress in microelectronic interconnect lines** *JOURNAL OF APPLIED PHYSICS*

Gleixner, R. J., Nix, W. D.
1998; 83 (7): 3595-3599

- **Measurement of the lattice thermal expansion coefficients of thin metal films on substrates** *JOURNAL OF APPLIED PHYSICS*
  Kraft, O., Nix, W. D.
  1998; 83 (6): 3035-3038
- **In memory of O.C. Shepard** *JOM-JOURNAL OF THE MINERALS METALS & MATERIALS SOCIETY*
  Nix, W. D.
  1998; 50 (3): 52-52
- **Indentation size effects in crystalline materials: A law for strain gradient plasticity** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Nix, W. D., Gao, H. J.
  1998; 46 (3): 411-425
- **Atomic size effects in Ni-Al based solid solutions** *ACTA MATERIALIA*
  Kitabjian, P. H., Nix, W. D.
  1998; 46 (2): 701-710
- **Determination of temperature dependent unstressed lattice spacings in crystalline thin films on substrates** *Symposium on Thin-Films - Stresses and Mechanical Properties VII at the MRS Fall Meeting*
  Cornella, G., Lee, S., Kraft, O., Nix, W. D., Bravman, J. C.
  MATERIALS RESEARCH SOCIETY.1998: 527–532
- **Thermomechanical behavior of continuous and patterned Al thin films** *Symposium on Materials Reliability in Microelectronics VIII*
  Kraft, O., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1998: 201–212
- **Measurement of mechanical properties in small dimensions by microbeam deflection** *Symposium on Microelectromechanical Structures for Materials Research*
  Kraft, O., Schwaiger, R., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1998: 39–44
- **Alloying effects in electromigration: Modeling and experiments** *4th International Workshop on Stress Induced Phenomena in Metallization*
  Spolenak, R., Kraft, O., Nix, W. D., Arzt, E.
  AMER INST PHYSICS.1998: 147–58
- **Stress evolution in sputtered FCC metal multilayers** *Symposium on Thin-Films - Stresses and Mechanical Properties VII at the MRS Fall Meeting*
  Ramaswamy, V., Nix, W. D., Clemens, B. M.
  MATERIALS RESEARCH SOCIETY.1998: 589–593
- **Modeling of failure time distributions for interconnects due to stress voiding and electromigration** *Symposium on Materials Reliability in Microelectronics VIII*
  Wolfer, W. G., Bartelt, M. C., DIKE, J. J., Hoyt, J. J., Gleixner, R. J., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1998: 147–158
- **In-situ TEM observations of surface roughening and defect formation in lattice mismatched heteroepitaxial thin films** *Symposium on Thin-Films - Stresses and Mechanical Properties VII at the MRS Fall Meeting*
  Ozkan, C. S., Nix, W. D., Gao, H. J.
  MATERIALS RESEARCH SOCIETY.1998: 291–298
- **Stress evolution during growth of sputtered Ni/Cu multilayers** *Symposium on Mechanisms and Principles of Epitaxial Growth in Metallic Systems at the Materials-Research-Society Spring Meeting*
  Ramaswamy, V., Clemens, B. M., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1998: 161–168
- **A new technique for visualizing the displacement field of indentations: The case of a soft film on a hard substrate** *Symposium on Thin-Films - Stresses and Mechanical Properties VII at the MRS Fall Meeting*
  Vlassak, J. J., Tsui, T. Y., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1998: 71–76

- **An analysis technique for extraction of thin film stresses from x-ray data** *APPLIED PHYSICS LETTERS*
  Cornella, G., Lee, S. H., Nix, W. D., Bravman, J. C.
  1997; 71 (20): 2949-2951

- **Elastic and plastic properties of thin films on substrates: nanoindentation techniques** *11th International Conference on the Strength of Materials (ICSMA-11)*
  Nix, W. D.
  ELSEVIER SCIENCE SA.1997: 37–44

- **Void nucleation in passivated interconnect lines: Effects of site geometries, interfaces, and interface flaws** *JOURNAL OF MATERIALS RESEARCH*
  Gleixner, R. J., Clemens, B. M., Nix, W. D.
  1997; 12 (8): 2081-2090

- **Void nucleation on a contaminated patch** *JOURNAL OF MATERIALS RESEARCH*
  Clemens, B. M., Nix, W. D., Gleixner, R. J.
  1997; 12 (8): 2038-2042

- **A simple technique for measuring the adhesion of brittle films to ductile substrates with application to diamond-coated titanium** *JOURNAL OF MATERIALS RESEARCH*
  Vlassak, J. J., DRORY, M. D., Nix, W. D.
  1997; 12 (7): 1900-1910

- **Strain relaxation and defect formation in heteroepitaxial Si1-xGex films via surface roughening induced by controlled annealing experiments** *APPLIED PHYSICS LETTERS*
  Ozkan, C. S., Nix, W. D., Gao, H. J.
  1997; 70 (17): 2247-2249

- **The solid-solution alloying effects of Ti on the high-temperature deformation behavior of NiAl single crystals** *Symposium on High-Temperature Ordered Intermetallic Alloys VII*
  Kitabjian, P. H., Garg, A., Noebe, R., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 479–486

- **Primary creep of Ni-3(Al,Ta) single crystals at room temperature** *Symposium on High-Temperature Ordered Intermetallic Alloys VII*
  Uchic, M. D., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 437–442

- **An examination of mass transport paths in conventional and highly textured Al-Cu interconnect lines** *Symposium on Polycrystalline Thin Films - Structure, Texture, Properties and Applications III, at the 1997 MRS Spring Meeting*
  Gleixner, R. J., Kaneko, H., Matsuo, M., Toyoda, H., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 319–324

- **Effect of stresses on defect nucleation in Si1-xGex/Si heteroepitaxial systems** *Symposium on Defects in Electronic Materials II, at the Combined Meeting of the Materials-Research-Society / International Conference on Electronic Materials*
  Ozkan, C. S., Nix, W. D., Gao, H. J.
  MATERIALS RESEARCH SOCIETY.1997: 373–379

- **Measuring interfacial fracture toughness with the blister test** *Symposium on Thin Films - Stresses and Mechanical Properties VI, at the 1996 MRS Spring Meeting*
  Hohlfelder, R. J., Luo, H., Vlassak, J. J., Chidsey, C. E., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 115–120

- **An analysis of void nucleation in passivated interconnect lines due to vacancy condensation and interface contamination** *Symposium on Thin Films - Stresses and Mechanical Properties VI, at the 1996 MRS Spring Meeting*
  Gleixner, R. J., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 405–410

- **Scanning stiffness microscopy - A novel technique for detecting sub-surface cracks** *Symposium on Materials Reliability in Microelectronics, at the 1997 MRS Spring Meeting*
  Saha, R., Tsui, T. Y., Ross, C. A., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1997: 285–290

- **Anisotropic behaviour of surface roughening in lattice mismatched heteroepitaxial thin films** *Symposium on Thin Films - Stresses and Mechanical Properties VI, at the 1996 MRS Spring Meeting*
  Ozkan, C. S., Nix, W. D., Gao, H. J.
  MATERIALS RESEARCH SOCIETY.1997: 487–492
- **Critical thickness condition for a strained compliant substrate/epitaxial film system** *APPLIED PHYSICS LETTERS*
  Freund, L. B., Nix, W. D.
  1996; 69 (2): 173-175
- **High-temperature deformation properties of NiAl single crystals** *METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  FORBES, K. R., Glatzel, U., Darolia, R., Nix, W. D.
  1996; 27 (5): 1229-1240
- **Identification of precipitate phases in a mechanically alloyed rapidly solidified Al-Fe-Ce alloy** *METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Ovecoglu, M. L., Suryanarayana, C., Nix, W. D.
  1996; 27 (4): 1033-1041
- **High-temperature creep behavior of single crystals of the solid-solution alloy NiAl-2.5Ti** *7th International Conference on Creep and Fracture of Engineering Materials and Structures*
  Kitabjian, P. H., Garg, A., Noebe, R. D., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1996: 667–676
- **Mechanisms of dislocation creep in single phase nickel and titanium aluminides** *2nd International Symposium on Structural Intermetallics (ISSI)*
  Hemker, K. J., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1996: 21–32
- **An analysis of void nucleation in passivated interconnect lines due to vacancy condensation and interface contamination** *Symposium on Materials Reliability in Microelectronics VI, at the 1996 MRS Spring Meeting*
  Gleixner, R. J., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1996: 475–480
- **Strain relaxation in heteroepitaxial Si1-xGex films via surface roughening processes** *Symposium on Evolution of Epitaxial Structure and Morphology*
  Ozkan, C. S., Nix, W. D., Gao, H. J.
  MATERIALS RESEARCH SOCIETY.1996: 407–412
- **Transient creep of Ni-3(Al,Ta) single crystals at room temperature** *7th International Conference on Creep and Fracture of Engineering Materials and Structures*
  Uchic, M. D., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1996: 269–278
- **EFFECT OF COHERENCY STRESSES ON THE HARDNESS OF EPITAXIAL FE(001)/PT(001) MULTILAYERS (VOL 66, PG 2969, 1995)** *APPLIED PHYSICS LETTERS*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  1995; 67 (7): 1036-1036
- **EFFECT OF COHERENCY STRESSES ON THE HARDNESS OF EPITAXIAL FE(001)/PT(001) MULTILAYERS** *APPLIED PHYSICS LETTERS*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  1995; 66 (22): 2969-2971
- **ANION ORDERING IN AGED STABILIZED BISMUTH OXIDE** *MATERIALS LETTERS*
  Jiang, N., Buchanan, R. M., Stevenson, D. A., Nix, W. D., Li, J. Z., Yang, J. L.
  1995; 22 (5-6): 215-219
- **Blister test analysis methods** *Symposium on Thin Films - Stresses and Mechanical Properties V, at the 1994 Fall Meeting of the Materials-Research-Society*
  Hohlfelder, R. J., Vlassak, J. J., Nix, W. D., Luo, H. H., Chidsey, C. E.
  MATERIALS RESEARCH SOCIETY.1995: 585–590

- **Dislocation processes and interactions in strained heteroepitaxial thin films** *Symposium on Micromechanics of Advanced Materials, in Honor of Professor James C M Lis 70th Birthday, at the Materials Week 95*
  GILLARD, V. T., Noble, D. B., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1995: 507–517

- **Measuring the mechanical properties of thin metal films by means of bulge testing of micromachined windows** *Symposium on Thin Films - Stresses and Mechanical Properties V, at the 1994 Fall Meeting of the Materials-Research-Society*
  PAVIOT, V. M., Vlassak, J. J., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1995: 579–584

- **In-situ observation of stress in Cu/Pd multilayers** *Symposium on Structure and Properties of Multilayered Thin Films, at the 1995 MRS Spring Meeting*
  Ueda, T., SIMENSON, G. F., Nix, W. D., Clemens, B. M.
  MATERIALS RESEARCH SOC.1995: 279–284

- **Measuring the adhesion of diamond thin films to substrates using the blister test** *Symposium on Mechanical Behavior of Diamond and Other Forms of Carbon*
  Sizemore, J., Hohlfelder, R. J., Vlassak, J. J., Nix, W. D.
  MATERIALS RESEARCH SOC.1995: 197–207

- **Boron diffusion in Si and Si1-xGex** *Symposium on Strained Layer Epitaxy-Materials, Processing, and Device Applications*
  Kuo, P., Hoyt, J. L., Gibbons, J. F., Turner, J. E., Lefforge, D.
  MATERIALS RESEARCH SOC.1995: 373–378

- **Role of dislocation interactions in decreasing mobile threading dislocation density and limiting strain relaxation in Si1-xGex heteroepitaxial films** *Symposium on Thin Films - Stresses and Mechanical Properties V, at the 1994 Fall Meeting of the Materials-Research-Society*
  GILLARD, V. T., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1995: 283–288

- **Enhanced hardness and stress-driven delamination in Fe/Pt multilayers** *Symposium on Structure and Properties of Multilayered Thin Films, at the 1995 MRS Spring Meeting*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  MATERIALS RESEARCH SOC.1995: 315–320

- **Role of dislocation interactions in decreasing mobile threading dislocation density and limiting strain relaxation in Si1-xGex heteroepitaxial films** *Symposium on Thin Films - Stresses and Mechanical Properties V, at the 1994 Fall Meeting of the Materials-Research-Society*
  GILLARD, V. T., Nix, W. D.
  MATERIALS RESEARCH SOCIETY.1995: 283–288

- **Enhanced hardness and stress-driven delamination in Fe/Pt multilayers** *Symposium on Structure and Properties of Multilayered Thin Films, at the 1995 MRS Spring Meeting*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  MATERIALS RESEARCH SOC.1995: 315–320

- **ENHANCED MECHANICAL HARDNESS IN COMPOSITIONALLY MODULATED FE(001)/PT(001) AND FE(001)/CR(001) EPITAXIAL THIN-FILMS** *THIN SOLID FILMS*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  1994; 253 (1-2): 218-222

- **INTRINSIC STRESSES IN COMPOSITIONALLY MODULATED AU-NI THIN-FILMS AND THE SUPERMODULUS EFFECT** *JOURNAL OF MATERIALS RESEARCH*
  Baker, S. P., Nix, W. D.
  1994; 9 (12): 3145-3152

- **MECHANICAL-PROPERTIES OF COMPOSITIONALLY MODULATED AU-NI THIN-FILMS - NANOINDENTATION AND MICROCANTILEVER DEFLECTION EXPERIMENTS** *JOURNAL OF MATERIALS RESEARCH*
  Baker, S. P., Nix, W. D.
  1994; 9 (12): 3131-3145

- **ROLE OF DISLOCATION BLOCKING IN LIMITING STRAIN RELAXATION IN HETEROEPITAXIAL FILMS** *JOURNAL OF APPLIED PHYSICS*
  GILLARD, V. T., Nix, W. D., Freund, L. B.

1994; 76 (11): 7280-7287

- **ELECTROMIGRATION FAILURE BY SHAPE CHANGE OF VOIDS IN BAMBOO LINES** *JOURNAL OF APPLIED PHYSICS*
  Arzt, E., Kraft, O., Nix, W. D., Sanchez, J. E.
  1994; 76 (3): 1563-1571
- **MEASURING THE ELASTIC PROPERTIES OF ANISOTROPIC MATERIALS BY MEANS OF INDENTATION EXPERIMENTS** *JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS*
  Vlassak, J. J., Nix, W. D.
  1994; 42 (8): 1223-1245
- **MECHANICAL STRENGTH AND MICROSTRUCTURE OF OXYGEN ION-IMPLANTED AL FILMS** *JOURNAL OF MATERIALS RESEARCH*
  Bader, S., Flinn, P. A., Arzt, E., Nix, W. D.
  1994; 9 (2): 318-327
- **THE ELASTIC BIAXIAL MODULUS OF AG-PD MULTILAYERED THIN-FILMS MEASURED USING THE BULGE TEST** *JOURNAL OF MATERIALS RESEARCH*
  Small, M. K., Daniels, B. J., Clemens, B. M., Nix, W. D.
  1994; 9 (1): 25-30
- **INTERFACIAL STRUCTURE AND MECHANICAL-PROPERTIES OF COMPOSITIONALLY-MODULATED AU-NI THIN-FILMS** *Symposium on Polycrystalline Thin Films: Structure, Texture, Properties and Applications, at the 1994 MRS Spring Meeting*
  Baker, S. P., Bain, J. A., Clemens, B. M., Nix, W. D.
  MATERIALS RESEARCH SOC.1994: 555–560
- **CALCULATION OF THE [111]-TEXTURE DEPENDENCE OF THE ELASTIC BIAXIAL MODULUS** *Symposium on Polycrystalline Thin Films: Structure, Texture, Properties and Applications, at the 1994 MRS Spring Meeting*
  Small, M. K., Nix, W. D.
  MATERIALS RESEARCH SOC.1994: 561–566
- **ENHANCED MECHANICAL HARDNESS IN COMPOSITIONALLY MODULATED FE PT AND FE CR EPITAXIAL THIN-FILMS** *Symposium on Polycrystalline Thin Films: Structure, Texture, Properties and Applications, at the 1994 MRS Spring Meeting*
  Daniels, B. J., Nix, W. D., Clemens, B. M.
  MATERIALS RESEARCH SOC.1994: 549–554
- **STUDY OF THE DISLOCATION PROCESSES ASSOCIATED WITH STRAIN RELAXATION IN SI-GE HETEROEPITAXIAL FILMS** *ZEITSCHRIFT FUR METALLKUNDE*
  GILLARD, V. T., Nix, W. D.
  1993; 84 (12): 874-880
- **STRAIN RELAXATION IN ULTRATHIN FILMS - A MODIFIED THEORY OF MISFIT-DISLOCATION ENERGETICS** *PHYSICAL REVIEW B*
  Payne, A. P., Nix, W. D., Lairson, B. M., Clemens, B. M.
  1993; 47 (20): 13730-13736
- **INDENTATION MODULUS OF ELASTICALLY ANISOTROPIC HALF-SPACES** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  Vlassak, J. J., Nix, W. D.
  1993; 67 (5): 1045-1056
- **INSITU OBSERVATION OF ANISOTROPIC STRAIN RELAXATION IN EPITAXIAL FE (110) FILMS ON MO (110)** *INTERNATIONAL SYMP ON MAGNETIC ULTRA THIN FILMS, MULTILAYERS AND SURFACES*
  Clemens, B. M., Osgood, R., Payne, A. P., Lairson, B. M., Brennan, S., White, R. L., Nix, W. D.
  ELSEVIER SCIENCE BV.1993: 37–41
- **HIGH-TEMPERATURE CREEP OF THE INTERMETALLIC ALLOY NI3AL** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Hemker, K. J., Nix, W. D.
  1993; 24 (2): 335-341
- **DISLOCATION ENERGIES FOR AN ANISOTROPIC CUBIC-CRYSTAL CALCULATIONS AND OBSERVATIONS FOR NIAL** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  Glatzel, U., FORBES, K. R., Nix, W. D.

1993; 67 (2): 307-323

- **ACCURACY AND RELIABILITY OF BULGE TEST EXPERIMENTS** *Symposium on Thin Films: Stresses and Mechanical Properties IV, at the 1993 Spring Meeting of the Materials-Research-Society*
  Small, M. K., Vlassak, J. J., Powell, S. F., Daniels, B. J., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 159–164

- **THE SEARCH FOR THE SUPERMODULUS EFFECT** *NATO ADVANCED STUDY INST ON MECHANICAL PROPERTIES AND DEFORMATION BEHAVIOR OF MATERIALS HAVING ULTRA-FINE MICROSTRUCTURES*
  Baker, S. P., Small, M. K., Vlassak, J. J., Daniels, B. J., Nix, W. D.
  KLUWER ACADEMIC PUBL.1993: 165–192

- **DISPERSION STRENGTHENING OF AL FILMS BY OXYGEN-ION IMPLANTATION** *Symposium on Thin Films: Stresses and Mechanical Properties IV, at the 1993 Spring Meeting of the Materials-Research-Society*
  Bader, S., Flinn, P. A., Arzt, E., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 317–321

- **TEM OBSERVATIONS OF DISLOCATION-STRUCTURE IN SINGLE-CRYSTALS OF NIAL AFTER HIGH-TEMPERATURE CREEP** *5TH SYMP ON HIGH-TEMPERATE ORDERED INTER-METALLIC ALLOY, AT THE 1992 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  Glatzel, U., FORBES, K. R., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 385–390

- **HIGH-TEMPERATURE DEFORMATION OF SINGLE-CRYSTALS OF NIAL** *5TH SYMP ON HIGH-TEMPERATE ORDERED INTER-METALLIC ALLOY, AT THE 1992 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  FORBES, K. R., Glatzel, U., Darolia, R., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 45–57

- **THE ROLE OF INDENTATION DEPTH ON THE MEASURED HARDNESS OF MATERIALS** *Symposium on Thin Films: Stresses and Mechanical Properties IV, at the 1993 Spring Meeting of the Materials-Research-Society*
  DEGUZMAN, M. S., Neubauer, G., Flinn, P., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 613–618

- **MOBILITY AND SUBSTRUCTURE CONTROLLED CREEP DEFORMATION OF [001] ORIENTED NIAL CRYSTALS** *5th International Conference on Creep and Fracture of Engineering Materials and Structures*
  FORBES, K. R., Nix, W. D.
  INST MATERIALS.1993: 265–274

- **STRESS DEPENDENCE OF THE VELOCITY OF THREADING DISLOCATION SEGMENTS IN SI-GE HETEROEPITAXIAL FILMS** *Symposium on Thin Films: Stresses and Mechanical Properties IV, at the 1993 Spring Meeting of the Materials-Research-Society*
  GILLARD, V. T., Noble, D. B., Nix, W. D.
  MATERIALS RESEARCH SOC.1993: 411–416

- **A NEW BULGE TEST TECHNIQUE FOR THE DETERMINATION OF YOUNG MODULUS AND POISSON RATIO OF THIN-FILMS** *JOURNAL OF MATERIALS RESEARCH*
  Vlassak, J. J., Nix, W. D.
  1992; 7 (12): 3242-3249

- **STEADY-STATE AND TRANSIENT CREEP-PROPERTIES OF AN ALUMINUM-ALLOY REINFORCED WITH ALUMINA FIBERS** *ACTA METALLURGICA ET MATERIALIA*
  Dragone, T. L., Nix, W. D.
  1992; 40 (10): 2781-2791

- **A CRITICAL ANALYSIS OF EXISTING MODELS FOR PLASTIC-FLOW IN NI3AL - COMPARISONS WITH TRANSIENT DEFORMATION EXPERIMENTS** *JOURNAL OF MATERIALS RESEARCH*
  Hemker, K. J., Mills, M. J., Nix, W. D.
  1992; 7 (8): 2059-2069

- **THERMAL-STRESSES IN ALUMINUM LINES BONDED TO SUBSTRATES** *IEEE TRANSACTIONS ON COMPONENTS HYBRIDS AND MANUFACTURING TECHNOLOGY*
  SAUTER, A. I., Nix, W. D.
  1992; 15 (4): 594-600

- **MECHANICAL-BEHAVIOR OF THIN-FILMS** *MRS BULLETIN*
  Bravman, J. C., Nix, W. D.
  1992; 17 (7): 25-27

- **ON VOID NUCLEATION AND GROWTH IN METAL INTERCONNECT LINES UNDER ELECTROMIGRATION CONDITIONS** *G MARSHALL POUND MEMORIAL SYMP ON THE KINETICS OF PHASE TRANSFORMATIONS, AT THE 1990 FALL MEETING OF THE MINERALS, METALS AND MATERIALS SOC*
  Nix, W. D., Arzt, E.
  MINERALS METALS MATERIALS SOC.1992: 2007–13

- **ANALYSIS OF THE ACCURACY OF THE BULGE TEST IN DETERMINING THE MECHANICAL-PROPERTIES OF THIN-FILMS** *JOURNAL OF MATERIALS RESEARCH*
  Small, M. K., Nix, W. D.
  1992; 7 (6): 1553-1563

- **A STUDY OF STRESS-DRIVEN DIFFUSIVE GROWTH OF VOIDS IN ENCAPSULATED INTERCONNECT LINES** *JOURNAL OF MATERIALS RESEARCH*
  SAUTER, A. I., Nix, W. D.
  1992; 7 (5): 1133-1143

- **NANOINDENTATION OF NANOCRYSTALLINE ZNO** *JOURNAL OF MATERIALS RESEARCH*
  Mayo, M. J., Siegel, R. W., Liao, Y. X., Nix, W. D.
  1992; 7 (4): 973-979

- **REEXAMINING THE BULGE TEST - METHODS FOR IMPROVING ACCURACY AND RELIABILITY** *3RD SYMP ON THIN FILMS : STRESSES AND MECHANICAL PROPERTIES, AT THE 1991 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  Small, M. K., Vlassak, J. J., Nix, W. D.
  MATERIALS RESEARCH SOC.1992: 257–262

- **INSITU STUDY OF ISOTHERMAL STRAIN RELAXATION IN SI-GE HETEROEPITAXIAL FILMS USING SUBSTRATE CURVATURE MEASUREMENTS** *3RD SYMP ON THIN FILMS : STRESSES AND MECHANICAL PROPERTIES, AT THE 1991 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  GILLARD, V. T., Noble, D. B., Nix, W. D.
  MATERIALS RESEARCH SOC.1992: 395–400

- **ELECTROMIGRATION RESISTANCE AND MECHANICAL STRENGTH - NEW PERSPECTIVES FOR INTERCONNECT MATERIALS** *3RD SYMP ON THIN FILMS : STRESSES AND MECHANICAL PROPERTIES, AT THE 1991 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  Arzt, E., Kraft, O., Sanchez, J., Bader, S., Nix, W. D.
  MATERIALS RESEARCH SOC.1992: 677–682

- **AN INVESTIGATION OF THE MECHANISMS THAT CONTROL INTERMEDIATE TEMPERATURE CREEP OF NI3AL** *ACTA METALLURGICA ET MATERIALIA*
  Hemker, K. J., Mills, M. J., Nix, W. D.
  1991; 39 (8): 1901-1913

- **PROCESSING AND CREEP CHARACTERIZATION OF A MODEL METAL MATRIX COMPOSITE - LEAD REINFORCED WITH NICKEL FIBERS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Dragone, T. L., SCHLAUTMANN, J. J., Nix, W. D.
  1991; 22 (5): 1029-1036

- **STRESS IN METAL LINES UNDER PASSIVATION - COMPARISON OF EXPERIMENT WITH FINITE-ELEMENT CALCULATIONS** *APPLIED PHYSICS LETTERS*
  Greenebaum, B., SAUTER, A. I., Flinn, P. A., Nix, W. D.
  1991; 58 (17): 1845-1847

- **THE EFFECT OF OXYGEN ON THE THERMAL-STABILITY OF SI1-XGEX STRAINED LAYERS** *APPLIED PHYSICS LETTERS*
  Noble, D. B., Hoyt, J. L., Nix, W. D., Gibbons, J. F., LADERMAN, S. S., Turner, J. E., Scott, M. P.
  1991; 58 (14): 1536-1538

- **FINITE-ELEMENT ANALYSIS OF CONE INDENTATION** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Bhattacharya, A. K., Nix, W. D.

1991; 27 (8): 1047-1058

- **MODELING OF ANOMALOUS FLOW IN INTERMETALLIC COMPOUNDS WITH THE L12 STRUCTURE** *SYMP ON MODELING THE DEFORMATION OF CRYSTALLINE SOLIDS, AT THE 1991 ANNUAL MEETING OF THE MINERALS, METALS AND MATERIALS SOC*
  Mills, M. J., Chrzan, D. C., Hemker, K. J., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1991: 423–436

- **A DESCRIPTION OF OCTAHEDRAL GLIDE IN NI3AL BASED ON OBSERVATIONS OF TRANSIENT DEFORMATION** *9TH INTERNATIONAL CONF ON THE STRENGTH OF METALS AND ALLOYS (ICSMA-9) : FUNDAMENTAL PHYSICAL ASPECTS OF STRENGTHENING OF CRYSTALLINE MATERIALS*
  Hemker, K. J., Mills, M. J., FORBES, K. R., STERNBERGH, D. D., Nix, W. D.
  FREUND PUBL HOUSE LTD.1991: 271–278

- **TRANSIENT DEFORMATION IN THE INTERMETALLIC ALLOY, NI3AL** *SYMP ON MODELING THE DEFORMATION OF CRYSTALLINE SOLIDS, AT THE 1991 ANNUAL MEETING OF THE MINERALS, METALS AND MATERIALS SOC*
  Hemker, K. J., Mills, M. J., FORBES, K. R., STERNBERGH, D. D., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1991: 411–421

- **THE EFFECT OF OXYGEN ON THE THERMAL-STABILITY OF SI1-XGEX STRAINED LAYERS GROWN BY LIMITED REACTION PROCESSING** *4TH INTERNATIONAL SYMP AT THE 1991 SPRING MEETING OF THE MATERIALS RESEARCH SOC : SILICON MOLECULAR BEAN EPITAXY*
  Noble, D. B., Hoyt, J. L., Kuo, P., Nix, W. D., Gibbons, J. F., LADERMAN, S. S., Turner, J. E., Rosner, S. J., Scott, M. P.
  MATERIALS RESEARCH SOC.1991: 247–252

- **GEOMETRIC FACTORS AFFECTING THE INTERNAL-STRESS DISTRIBUTION AND HIGH-TEMPERATURE CREEP RATE OF DISCONTINUOUS FIBER REINFORCED METALS** *ACTA METALLURGICA ET MATERIALIA*
  Dragone, T. L., Nix, W. D.
  1990; 38 (10): 1941-1953

- **MEASURING STIFFNESSES AND RESIDUAL-STRESSES OF SILICON-NITRIDE THIN-FILMS** *1989 FALL MEETING OF THE METALLURGICAL SOC : DEFORMATION IN ELECTRONIC MATERIALS AND DEVICES*
  Hong, S., Weihs, T. P., Bravman, J. C., Nix, W. D.
  MINERALS METALS MATERIALS SOC.1990: 903–9

- **ON THE QUESTION OF STRAIN RATE CONTINUITY IN STRESS RATE CHANGE EXPERIMENTS** *SCRIPTA METALLURGICA ET MATERIALIA*
  Kuo, C. M., FORBES, K. R., Baker, S. P., Nix, W. D.
  1990; 24 (9): 1623-1628

- **NUMERICAL-ANALYSIS OF CREEP CRACK-GROWTH IN PRECAVITATED POLYCRYSTALLINE COPPER** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Kim, Y. S., Nix, W. D.
  1990; 127 (1): 41-50

- **MECHANICAL-PROPERTIES OF NANOPHASE TIO2 AS DETERMINED BY NANOINDENTATION** *JOURNAL OF MATERIALS RESEARCH*
  Mayo, M. J., Siegel, R. W., Narayanasamy, A., Nix, W. D.
  1990; 5 (5): 1073-1082

- **HIGH-TEMPERATURE CRACK-GROWTH IN COPPER UNDER CYCLIC LOADING CONDITIONS** *SCRIPTA METALLURGICA ET MATERIALIA*
  Kim, Y. S., Nix, W. D.
  1990; 24 (1): 213-218

- **A NUMERICAL STUDY OF HIGH-TEMPERATURE CREEP DEFORMATION IN METAL-MATRIX COMPOSITES** *INTERNATIONAL CONF AT THE 1990 ANNUAL MEETING OF THE MINERALS, METALS AND MATERIALS SOC*
  Dragone, T. L., Nix, W. D.
  MINERALS, METALS & MATERIALS SOC.1990: 367–380

- **STRAIN-HARDENING AND SUBSTRUCTURAL EVOLUTION IN NI-CO SOLID-SOLUTIONS AT LARGE STRAINS** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Hughes, D. A., Nix, W. D.
  1989; 122 (2): 153-172

- **CREEP CRACK-GROWTH IN COPPER CONTAINING PRE-IMPLANTED GRAIN-BOUNDARY CAVITIES** *ACTA METALLURGICA*
  Kim, Y. S., Nix, W. D.
  1989; 37 (9): 2531-2538
- **DIRECT OBSERVATION OF SUPERPLASTIC FLOW MECHANISMS IN TORSION** *ACTA METALLURGICA*
  Mayo, M. J., Nix, W. D.
  1989; 37 (4): 1121-1134
- **AN INVESTIGATION OF THE CREEP OF NI3AL(B,HF) SINGLE-CRYSTALS AT INTERMEDIATE TEMPERATURES** *3RD SYMP ON HIGH-TEMPERATURE ORDERED INTERMETALLIC ALLOYS, HELD AT THE 1988 FALL MEETING OF THE MATERIALS RESEARCH SOC*
  Hemker, K. J., Nix, W. D.
  MATERIALS RESEARCH SOC.1989: 481–486
- **ELEVATED-TEMPERATURE CHARACTERIZATION AND DEFORMATION-BEHAVIOR OF MECHANICALLY ALLOYED RAPIDLY SOLIDIFIED AL-8.4WT-PERCENT-FE-3.5WT-PERCENT-CE ALLOY** *CONF ON NEW MATERIALS BY MECHANICAL ALLOYING TECHNIQUES*
  Ovecoglu, M. L., Nix, W. D.
  DGM METALLURGY INFORMATION.1989: 287–295
- **THE ABSENCE OF STEADY-STATE FLOW DURING LARGE STRAIN PLASTIC-DEFORMATION OF SOME FCC METALS AT LOW AND INTERMEDIATE TEMPERATURES** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Hughes, D. A., Nix, W. D.
  1988; 19 (12): 3013-3024
- **MECHANICAL DEFLECTION OF CANTILEVER MICROBEAMS - A NEW TECHNIQUE FOR TESTING THE MECHANICAL-PROPERTIES OF THIN-FILMS** *JOURNAL OF MATERIALS RESEARCH*
  Weihs, T. P., Hong, S., Bravman, J. C., Nix, W. D.
  1988; 3 (5): 931-942
- **MECHANISMS OF ELEVATED-TEMPERATURE DEFORMATION IN THE B2 ALUMINIDES NIAL AND COAL** *JOURNAL OF MATERIALS SCIENCE*
  YANEY, D. L., Nix, W. D.
  1988; 23 (9): 3088-3098
- **A MICRO-INDENTATION STUDY OF SUPERPLASTICITY IN PB, SN, AND SN-38 WT-PERCENT-PB** *ACTA METALLURGICA*
  Mayo, M. J., Nix, W. D.
  1988; 36 (8): 2183-2192
- **MECHANISMS AND CONTROLLING FACTORS IN CREEP FRACTURE** *MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING*
  Nix, W. D.
  1988; 103 (1): 103-110
- **CRACK TIP STRESS-FIELDS AND DISLOCATION NUCLEATION IN ANISOTROPIC MATERIALS** *SCRIPTA METALLURGICA*
  Dragone, T. L., Nix, W. D.
  1988; 22 (3): 431-435
- **DIRECT MEASUREMENTS OF THE FRICTIONAL RESISTANCE TO SLIDING OF A FIBER IN A BRITTLE MATRIX** *SCRIPTA METALLURGICA*
  Weihs, T. P., Nix, W. D.
  1988; 22 (2): 271-275
- **TWO-DIMENSIONAL THERMAL-OXIDATION OF SILICON .2. MODELING STRESS EFFECTS IN WET OXIDES** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Kao, D. B., McVittie, J. P., Nix, W. D., Saraswat, K. C.
  1988; 35 (1): 25-37
- **FINITE-ELEMENT SIMULATION OF INDENTATION EXPERIMENTS** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Bhattacharya, A. K., Nix, W. D.
  1988; 24 (9): 881-891
- **STRESSES AND DEFORMATION PROCESSES IN THIN-FILMS ON SUBSTRATES** *CRC CRITICAL REVIEWS IN SOLID STATE AND MATERIALS SCIENCES*

Doerner, M. F., Nix, W. D.
1988; 14 (3): 225-268

- **ANALYSIS OF ELASTIC AND PLASTIC-DEFORMATION ASSOCIATED WITH INDENTATION TESTING OF THIN-FILMS ON SUBSTRATES** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Bhattacharya, A. K., Nix, W. D.
  1988; 24 (12): 1287-1298

- **ELASTIC INTERACTIONS OF SCREW DISLOCATIONS IN THIN-FILMS ON SUBSTRATES** *ACTA METALLURGICA*
  Ovecoglu, M. L., Doerner, M. F., Nix, W. D.
  1987; 35 (12): 2947-2957

- **CONTROLLING FACTORS FOR CRACK-GROWTH UNDER CREEP CONDITIONS** *ACTA METALLURGICA*
  Wang, J. S., Kim, Y. S., Nix, W. D.
  1987; 35 (10): 2593-2605

- **ANALYSIS OF THE INTERFACIAL STRESSES PRODUCED BY A PILE-UP OF DISCRETE EDGE DISLOCATIONS IN 2 PHASE MATERIALS** *ACTA METALLURGICA*
  Ovecoglu, M. L., Barnett, D. M., Nix, W. D.
  1987; 35 (7): 1779-1789

- **SIMULATIONS OF STABLE CRACK-PROPAGATION BASED ON CAVITY GROWTH BY COUPLED DIFFUSIONAL AND CREEP PROCESSES** *ACTA METALLURGICA*
  Earthman, J. C., Nix, W. D.
  1987; 35 (7): 1475-1485

- **A NEW STRAIN RATE CHANGE TECHNIQUE FOR DISTINGUISHING BETWEEN PURE METAL AND ALLOY TYPE CREEP-BEHAVIOR** *ACTA METALLURGICA*
  YANEY, D. L., Gibeling, J. C., Nix, W. D.
  1987; 35 (6): 1391-1400

- **A NUMERICAL-MODEL FOR PREDICTION OF CREEP FRACTURE** *MATERIALS SCIENCE AND ENGINEERING*
  Wang, J. S., Nix, W. D.
  1987; 89: 73-80

- **ELEVATED-TEMPERATURE DEFORMATION-BEHAVIOR OF AN AL-8.4 WT PCT FE-3.6 WT PCT CE ALLOY** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  YANEY, D. L., Nix, W. D.
  1987; 18 (5): 893-902

- **TWO-DIMENSIONAL THERMAL-OXIDATION OF SILICON .1. EXPERIMENTS** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Kao, D. B., McVittie, J. P., Nix, W. D., Saraswat, K. C.
  1987; 34 (5): 1008-1017

- **MEASUREMENT AND INTERPRETATION OF STRESS IN ALUMINUM-BASED METALLIZATION AS A FUNCTION OF THERMAL HISTORY** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Flinn, P. A., Gardner, D. S., Nix, W. D.
  1987; 34 (3): 689-699

- **CHARACTERIZATIONS OF HIGH-TEMPERATURE CRACK-GROWTH IN COPPER AND CU + 1 WT-PERCENT-SB UNDER DIFFERENT LOADING CONDITIONS** *ACTA METALLURGICA*
  Earthman, J. C., Nix, W. D.
  1987; 35 (2): 463-472

- **ON THE LIMITATIONS OF DYNAMIC RECOVERY AS REVEALED BY TEMPERATURE-CHANGE TESTS AT LARGE STRAINS** *SCRIPTA METALLURGICA*
  Hughes, D. A., Nix, W. D.
  1986; 20 (10): 1455-1458

- **DISLOCATIONS IN EXTRUDED CO-49.3 AT-PERCENT-AL** *JOURNAL OF MATERIALS SCIENCE*
  YANEY, D. L., Pelton, A. R., Nix, W. D.

1986; 21 (6): 2083-2087

- **MEASUREMENT OF ANELASTIC CREEP STRAINS IN A1-5.5 AT PERCENT MG USING A NEW TECHNIQUE - IMPLICATIONS FOR THE MECHANISM OF CLASS-I CREEP** *ACTA METALLURGICA*
  Mills, M. J., Gibeling, J. C., Nix, W. D.
  1986; 34 (5): 915-925
- **HIGH-TEMPERATURE CREEP AND FRACTURE PROPERTIES OF A CLASS-I SOLID-SOLUTION ALLOY - CU-2.7 AT-PERCENT-SN** *ACTA METALLURGICA*
  Wang, J. S., Nix, W. D.
  1986; 34 (3): 545-555
- **CONSTRAINED CAVITY GROWTH-MODELS OF LONGITUDINAL CREEP DEFORMATION OF OXIDE DISPERSION STRENGTHENED ALLOYS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Stephens, J. J., Nix, W. D.
  1986; 17 (2): 281-293
- **VOID FORMATION IN INCONEL MA-754 BY HIGH-TEMPERATURE OXIDATION** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Rosenstein, A. H., TIEN, J. K., Nix, W. D.
  1986; 17 (1): 151-162
- **CHARACTERIZATION OF RAPIDLY SOLIDIFIED AND MECHANICALLY ALLOYED AL-FE-CE POWDERS** *INTERNATIONAL JOURNAL OF POWDER METALLURGY*
  Ovecoglu, M. L., Nix, W. D.
  1986; 22 (1): 17-?
- **UNLOADING YIELD EFFECTS IN ALUMINUM-ALLOYS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Nieh, T. G., Nix, W. D.
  1986; 17 (1): 121-126
- **TIME-DEPENDENT DEFORMATION OF METALS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Nix, W. D., Gibeling, J. C., Hughes, D. A.
  1985; 16 (12): 2215-2226
- **THE EFFECT OF GRAIN MORPHOLOGY ON LONGITUDINAL CREEP-PROPERTIES OF INCONEL MA-754 AT ELEVATED-TEMPERATURES** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Stephens, J. J., Nix, W. D.
  1985; 16 (7): 1307-1324
- **A STATISTICAL-ANALYSIS OF CAVITY NUCLEATION AT PARTICLES IN GRAIN-BOUNDARIES** *ACTA METALLURGICA*
  Wang, J. S., Stephens, J. J., Nix, W. D.
  1985; 33 (6): 1009-1021
- **HIGH-TEMPERATURE DEFORMATION OF ULTRA-FINE-GRAINED OXIDE DISPERSION STRENGTHENED ALLOYS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Gregory, J. K., Gibeling, J. C., Nix, W. D.
  1985; 16 (5): 777-787
- **HIGH-TEMPERATURE INTERGRANULAR CRACK-GROWTH PROCESSES IN COPPER AND COPPER WITH 1 WT-PERCENT ANTIMONY** *ACTA METALLURGICA*
  Earthman, J. C., Gibeling, J. C., Nix, W. D.
  1985; 33 (5): 805-817
- **A DISLOCATION LOOP MODEL FOR CREEP OF SOLID-SOLUTIONS BASED ON THE STEADY-STATE AND TRANSIENT CREEP-PROPERTIES OF A1-5.5 AT PERCENT-MG** *ACTA METALLURGICA*
  Mills, M. J., Gibeling, J. C., Nix, W. D.
  1985; 33 (8): 1503-1514
- **ANALYSIS OF CAVITY NUCLEATION IN SOLIDS SUBJECTED TO EXTERNAL AND INTERNAL-STRESSES** *ACTA METALLURGICA*
  HIRTH, J. P., Nix, W. D.

1985; 33 (3): 359-368

- **DIFFUSIONALLY MODIFIED DISLOCATION PARTICLE ELASTIC INTERACTIONS** *ACTA METALLURGICA*
  Srolovitz, D. J., Luton, M. J., PETKOVICLUTON, R., Barnett, D. M., Nix, W. D.
  1984; 32 (7): 1079-1088
- **A CRITICAL ANALYSIS OF THE DETERMINATION OF DEFORMATION MECHANISMS BY STRAIN RATE CHANGE TESTS** *ACTA METALLURGICA*
  Gibeling, J. C., HOLBROOK, J. H., Nix, W. D.
  1984; 32 (9): 1287-1295
- **THE EFFECTS OF PRE-EXISTING GRAIN-BOUNDARY CAVITIES ON THE CREEP-RUPTURE LIFE OF A COPPER-ANTIMONY ALLOY** *SCRIPTA METALLURGICA*
  Yu, K. S., Nix, W. D.
  1984; 18 (3): 259-264
- **ON THE RELATION BETWEEN CREEP CAVITATION AND GRAIN-BOUNDARY ORIENTATION** *SCRIPTA METALLURGICA*
  Yu, K. S., Nix, W. D.
  1984; 18 (2): 173-178
- **ON THE RELATION BETWEEN CREEP CAVITATION AND GRAIN-BOUNDARY ORIENTATION** *SCRIPTA METALLURGICA*
  Yu, K. S., Nix, W. D.
  1984; 18 (2): 173-178
- **A STUDY OF INTERGRANULAR CAVITY GROWTH CONTROLLED BY THE COUPLING OF DIFFUSION AND POWER LAW CREEP** *ACTA METALLURGICA*
  Wang, J. S., Martinez, L., Nix, W. D.
  1983; 31 (6): 873-881
- **A STUDY OF THE CHEMICAL-COMPOSITION OF GRAIN-BOUNDARIES AND CREEP CAVITY SURFACES IN A CU-SB ALLOY** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Yu, K. S., Joshi, A., Nix, W. D.
  1983; 14 (12): 2447-2454
- **THE EFFECTS OF SEGREGATION ON THE KINETICS OF INTERGRANULAR CAVITY GROWTH UNDER CREEP CONDITIONS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Nix, W. D., Yu, K. S., Wang, J. S.
  1983; 14 (4): 563-570
- **INTRODUCTION TO THE VIEWPOINT SET ON CREEP CAVITATION** *SCRIPTA METALLURGICA*
  Nix, W. D.
  1983; 17 (1): 1-4
- **THE BINDING FORCE BETWEEN AN EDGE DISLOCATION AND A FERMI DIRAC SOLUTE ATMOSPHERE** *ACTA METALLURGICA*
  Barnett, D. M., OLIVER, W. C., Nix, W. D.
  1982; 30 (3): 673-678
- **HIGH-TEMPERATURE DEFORMATION OF OXIDE DISPERSION STRENGTHENED AL AND AL-MG SOLID-SOLUTIONS** *ACTA METALLURGICA*
  OLIVER, W. C., Nix, W. D.
  1982; 30 (7): 1335-1347
- **THE BINDING FORCE BETWEEN A PEIERLS-NABARRO EDGE DISLOCATION AND A FERMI-DIRAC SOLUTE ATMOSPHERE** *ACTA METALLURGICA*
  Barnett, D. M., Wong, G., Nix, W. D.
  1982; 30 (11): 2035-2041
- **A NUMERICAL STUDY OF CAVITY GROWTH CONTROLLED BY COUPLED SURFACE AND GRAIN-BOUNDARY DIFFUSION** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Martinez, L., Nix, W. D.
  1982; 13 (3): 427-437

- **AN ANALYSIS OF TRANSIENT CAVITY GROWTH CONTROLLED BY GRAIN-BOUNDARY DIFFUSION** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Martinez, L., Nix, W. D.
  1981; 12 (1): 23-30
- **SEGREGATION DURING DIFFUSIONAL CREEP OF A BINARY SOLID-SOLUTION** *ACTA METALLURGICA*
  FUENTESSAMANIEGO, R., Nix, W. D., POUND, G. M.
  1981; 29 (3): 487-492
- **OBSERVATIONS OF ANELASTIC BACKFLOW FOLLOWING STRESS REDUCTIONS DURING CREEP OF PURE METALS** *ACTA METALLURGICA*
  Gibeling, J. C., Nix, W. D.
  1981; 29 (10): 1769-1784
- **STEADY-STATE DIFFUSIONAL GROWTH OF AN AXISYMMETRIC CAVITY ON A GRAIN-BOUNDARY** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  FUENTESSAMANIEGO, R., Nix, W. D.
  1981; 44 (3): 601-612
- **EMBRITTLEMENT OF COPPER DUE TO SEGREGATION OF OXYGEN TO GRAIN-BOUNDARIES** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Nieh, T. G., Nix, W. D.
  1981; 12 (5): 893-901
- **EFFECTS OF CAPILLARITY ON INTERGRANULAR CAVITY GROWTH CONTROLLED BY DIFFUSION AND PLASTICITY** *SCRIPTA METALLURGICA*
  Martinez, L., Nix, W. D.
  1981; 15 (7): 757-761
- **EFFECTS OF STRAIN-HARDENING IN HYDROSTATIC EXTRUSION OF AXISYMMETRIC BIMETAL RODS** *METALS TECHNOLOGY*
  OLIVER, W. C., Nix, W. D.
  1981; 8 (FEB): 75-76
- **THE STRUCTURE AND PROPERTIES OF ALUMINUM-ALLOYS PRODUCED BY MECHANICAL ALLOYING - POWDER PROCESSING AND RESULTANT POWDER STRUCTURES** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Gilman, P. S., Nix, W. D.
  1981; 12 (5): 813-824
- **THE EFFECTS OF GRAIN SHAPE ON NABARRO-HERRING AND COBLE CREEP PROCESSES** *METALS FORUM*
  Nix, W. D.
  1981; 4 (1-2): 38-43
- **APPROPRIATE DIFFUSION-COEFFICIENTS FOR DESCRIBING CREEP PROCESSES IN SOLID-SOLUTION ALLOYS** *SCRIPTA METALLURGICA*
  FUENTESSAMANIEGO, R., Nix, W. D.
  1981; 15 (1): 15-20
- **EQUIVALENCE OF 2 METHODS FOR COMPUTING THE ACTIVATION ENTROPY FOR DISLOCATION-MOTION** *ACTA METALLURGICA*
  DiMelfi, R. J., Nix, W. D., Barnett, D. M., POUND, G. M.
  1980; 28 (2): 231-237
- **THE INFLUENCE OF 2ND PHASE PARTICLES ON THE FREE DISLOCATION DENSITY DURING CREEP OF STAINLESS-STEEL** *SCRIPTA METALLURGICA*
  Singer, R. F., Blum, W., Nix, W. D.
  1980; 14 (7): 755-760
- **COMPARISON OF THE DIMPLE SPACING ON INTERGRANULAR CREEP FRACTURE SURFACES WITH THE SLIP BAND SPACING FOR COPPER** *SCRIPTA METALLURGICA*
  Nieh, T. G., Nix, W. D.
  1980; 14 (3): 365-368

- **VACANCY AND SUBSTITUTIONAL SOLUTE DISTRIBUTION AROUND AN EDGE DISLOCATION IN EQUILIBRIUM AND IN STEADY-STATE GLIDE MOTION** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  FUENTESSAMANIEGO, R., Nix, W. D., POUND, G. M.
  1980; 42 (5): 591-600
- **A NUMERICAL STUDY OF LONG-RANGE INTERNAL-STRESSES ASSOCIATED WITH SUBGRAIN BOUNDARIES** *ACTA METALLURGICA*
  Gibeling, J. C., Nix, W. D.
  1980; 28 (12): 1743-1752
- **THE FORMATION OF WATER-VAPOR BUBBLES IN COPPER AND THEIR EFFECT ON INTERGRANULAR CREEP FRACTURE** *ACTA METALLURGICA*
  Nieh, T. G., Nix, W. D.
  1980; 28 (5): 557-566
- **CONDITIONS FOR VALIDITY OF THE EXPRESSION DELTA-S=-(DELTA-DELTA-G/DELTA-T)T** *SCRIPTA METALLURGICA*
  POUND, G. M., Lothe, J., Nix, W. D., Barnett, D. M., DiMelfi, R. J.
  1980; 14 (3): 369-372
- **IDENTIFICATION OF DISPERSOID PHASES CREATED IN ALUMINUM DURING MECHANICAL ALLOYING** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  Singer, R. F., OLIVER, W. C., Nix, W. D.
  1980; 11 (11): 1895-1901
- **THE DESCRIPTION OF ELEVATED-TEMPERATURE DEFORMATION IN TERMS OF THRESHOLD STRESSES AND BACK STRESSES - A REVIEW** *MATERIALS SCIENCE AND ENGINEERING*
  Gibeling, J. C., Nix, W. D.
  1980; 45 (2): 123-135
- **NUMERICAL STUDY OF NECKING IN THE PLANE TENSION TEST** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  Burke, M. A., Nix, W. D.
  1979; 15 (5): 379-393
- **SUPERPLASTIC BEHAVIOR OF A SINGLE PHASE-60-PB - 40 IN ALLOY** *SCRIPTA METALLURGICA*
  Wei, J. C., Nix, W. D.
  1979; 13 (11): 1017-1020
- **THEORETICAL DESCRIPTIONS OF CLIMB CONTROLLED STEADY-STATE CREEP AT HIGH AND INTERMEDIATE TEMPERATURES** *ACTA METALLURGICA*
  Spingarn, J. R., Barnett, D. M., Nix, W. D.
  1979; 27 (9): 1549-1561
- **STUDY OF INTERGRANULAR CAVITY GROWTH IN AG + 0.1-PERCENT-MGO AT ELEVATED-TEMPERATURES** *ACTA METALLURGICA*
  Nieh, T. G., Nix, W. D.
  1979; 27 (6): 1097-1106
- **NUMERICAL STUDY OF CAVITY GROWTH CONTROLLED BY SURFACE-DIFFUSION** *ACTA METALLURGICA*
  Pharr, G. M., Nix, W. D.
  1979; 27 (10): 1615-1631
- **APPLICATION OF THE METHODS OF DISLOCATION DYNAMICS TO DESCRIBE PLASTIC-FLOW IN BOTH BCC AND FCC METALS** *ACTA METALLURGICA*
  Pharr, G. M., Nix, W. D.
  1979; 27 (3): 433-444
- **MODEL FOR CREEP BASED ON THE CLIMB OF DISLOCATIONS AT GRAIN-BOUNDARIES** *ACTA METALLURGICA*
  Spingarn, J. R., Nix, W. D.
  1979; 27 (2): 171-177
- **COALESCENCE OF LARGE GRAIN-BOUNDARY CAVITIES IN SILVER DURING TENSION CREEP** *ACTA METALLURGICA*
  Goods, S. H., Nix, W. D.

1978; 26 (5): 753-758

- **STUDY OF CREEP-PROPERTIES OF A NI-FE METALLIC GLASS** *SCRIPTA METALLURGICA*
  Gibeling, J. C., Nix, W. D.
  1978; 12 (10): 919-926
- **DIFFUSIONAL CREEP AND DIFFUSIONALLY ACCOMMODATED GRAIN REARRANGEMENT** *ACTA METALLURGICA*
  Spingarn, J. R., Nix, W. D.
  1978; 26 (9): 1389-1398
- **NUMERICAL-ANALYSIS OF EDGE DISLOCATION CLIMB** *PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES*
  Burke, M. A., Nix, W. D.
  1978; 37 (4): 479-488
- **CRITIQUE OF AYRES-STEIN METHOD OF PREDICTING CLEAVAGE PLANES IN METALS** *SCRIPTA METALLURGICA*
  Pharr, G. M., Barnett, D. M., Nix, W. D.
  1978; 12 (11): 973-978
- **KINETICS OF CAVITY GROWTH AND CREEP FRACTURE IN SILVER CONTAINING IMPLANTED GRAIN-BOUNDARY CAVITIES** *ACTA METALLURGICA*
  Goods, S. H., Nix, W. D.
  1978; 26 (5): 739-752
- **HIGH DUCTILITIES IN PHYSICALLY VAPOR-DEPOSITED NICKEL** *THIN SOLID FILMS*
  Spingarn, J. R., Jacobson, B. E., Nix, W. D.
  1977; 45 (3): 507-515
- **INTERRELATIONSHIPS BETWEEN MICROSTRUCTURES AND MECHANICAL-PROPERTIES OF PHYSICALLY VAPOR-DEPOSITED NI-AL2O3 ALLOYS** *THIN SOLID FILMS*
  Jacobson, B. E., Spingarn, J. R., Nix, W. D.
  1977; 45 (3): 517-526
- **ROLE OF DIFFUSION IN DETERMINING CONTROLLING CREEP MECHANISMS IN AL-ZN SOLID-SOLUTIONS .2.** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  CHIN, B. A., Nix, W. D., POUND, G. M.
  1977; 8 (10): 1523-1530
- **STRESS DEPENDENCE OF CRACK GROWTH-RATE DURING CREEP** *INTERNATIONAL JOURNAL OF FRACTURE*
  DiMelfi, R. J., Nix, W. D.
  1977; 13 (3): 341-348
- **DISLOCATION-STRUCTURE OF NI-20CR-2THO2 AFTER HIGH-TEMPERATURE DEFORMATION** *ACTA METALLURGICA*
  Hausselt, J. H., Nix, W. D.
  1977; 25 (6): 595-607
- **MODEL FOR HIGH-TEMPERATURE DEFORMATION OF DISPERSION STRENGTHENED METALS BASED ON SUBSTRUCTURAL OBSERVATIONS IN NI-20CR-2THO2** *ACTA METALLURGICA*
  Hausselt, J. H., Nix, W. D.
  1977; 25 (12): 1491-1502
- **MODEL FOR CREEP FRACTURE BASED ON PLASTIC GROWTH OF CAVITIES AT TIPS OF GRAIN-BOUNDARY WEDGE CRACKS** *ACTA METALLURGICA*
  Nix, W. D., MATLOCK, D. K., DiMelfi, R. J.
  1977; 25 (5): 495-503
- **ROLE OF DIFFUSION IN DETERMINING CONTROLLING CREEP MECHANISMS IN AL-ZN SOLID-SOLUTIONS .1.** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  CHIN, B. A., POUND, G. M., Nix, W. D.
  1977; 8 (10): 1517-1522

- **ANALYSIS OF ENTROPY OF THERMALLY ACTIVATED DISLOCATION-MOTION BASED ON THEORY OF THERMOELASTICITY** *PHYSICA STATUS SOLIDI B-BASIC RESEARCH*
  DiMelfi, R. J., Nix, W. D., Barnett, D. M., HOLBROOK, J. H., POUND, G. M.
  1976; 75 (2): 573-582
- **STRUCTURE AND MECHANICAL-PROPERTIES OF PHYSICALLY VAPOR-DEPOSITED CHROMIUM** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  REILEY, T. C., Nix, W. D.
  1976; 7 (11): 1695-1701
- **COMPARISON OF EMBRITTLING EFFECTS OF H2O BUBBLES IN AG WITH THOSE OF HE BUBBLES IN NI 6 PERCENT W** *ACTA METALLURGICA*
  Goods, S. H., Nix, W. D.
  1976; 24 (11): 1041-1046
- **HIGH-TEMPERATURE CREEP OF NI-20CR-2THO-2 SINGLE-CRYSTALS** *ACTA METALLURGICA*
  LUND, R. W., Nix, W. D.
  1976; 24 (5): 469-481
- **COMPARISON OF OROWAN STRESS WITH THRESHOLD STRESS FOR CREEP FOR NI-20CR-2THO2 SINGLE-CRYSTALS** *SCRIPTA METALLURGICA*
  Pharr, G. M., Nix, W. D.
  1976; 10 (11): 1007-1010
- **HOLE GROWTH IN PLANE VISCOUS CREEP INCLUDING INTERACTION EFFECTS** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
  DiMelfi, R. J., Nix, W. D.
  1976; 12 (3): 217-225
- **PLASTIC INSTABILITIES IN TENSION CREEP** *ACTA METALLURGICA*
  Burke, M. A., Nix, W. D.
  1975; 23 (7): 793-798
- **HIGH CREEP ACTIVATION-ENERGIES FOR DISPERSION STRENGTHENED METALS** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  LUND, R. W., Nix, W. D.
  1975; 6 (7): 1329-1333
- **EFFECTS OF HELIUM ON HIGH-TEMPERATURE CREEP AND FRACTURE PROPERTIES OF NI-6PERCENT W** *JOURNAL OF NUCLEAR MATERIALS*
  MATLOCK, D. K., Nix, W. D.
  1975; 56 (2): 145-152
- **INFLUENCE OF SUBGRAIN BOUNDARIES ON RATE CONTROLLING CREEP PROCESSES IN FE-3 PCT SI** *METALLURGICAL TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE*
  STANG, R. G., Nix, W. D., Barrett, C. R.
  1975; 6 (11): 2065-2071
- **EFFECT OF SAMPLE SIZE ON STEADY-STATE CREEP CHARACTERISTICS OF NI-6 PCT-W** *METALLURGICAL TRANSACTIONS*
  MATLOCK, D. K., Nix, W. D.
  1974; 5 (6): 1401-1412
- **MODEL FOR MOBILE DISLOCATION DENSITY** *ACTA METALLURGICA*
  GASCANER, R., Nix, W. D.
  1974; 22 (3): 257-264
- **EDGE DISLOCATION CLIMB OVER NONDEFORMABLE CIRCULAR INCLUSIONS** *METALLURGICAL TRANSACTIONS*
  HOLBROOK, J. H., Nix, W. D.
  1974; 5 (5): 1033-1039

- **HIGH-TEMPERATURE DISLOCATION MOBILITY IN LIF .1. CHARGED DISLOCATIONS IN IONIC-CRYSTALS** *MATERIALS SCIENCE AND ENGINEERING*
  Menezes, R. A., Nix, W. D.
  1974; 16 (1-2): 57-66
- **EFFECTS OF SHOCK LOADING AND COLD ROLLING ON STRUCTURE AND HIGH-TEMPERATURE CREEP-PROPERTIES OF STRENGTHENED NI-18.6 PCT CR-4.3 PCT AL** *METALLURGICAL TRANSACTIONS*
  Harrigan, W. C., Barrett, C. R., Nix, W. D.
  1974; 5 (1): 205-216
- **COMPUTER-SIMULATION OF HIGH-TEMPERATURE DEFORMATION** *MATERIALS SCIENCE AND ENGINEERING*
  GASCANER, R., Nix, W. D.
  1974; 14 (2): 131-142
- **HIGH-TEMPERATURE DISLOCATION MOBILITY IN LIF .2. GLIDE MOBILITY OF DISLOCATIONS AT HIGH-TEMPERATURES** *MATERIALS SCIENCE AND ENGINEERING*
  Menezes, R. A., Nix, W. D.
  1974; 16 (1-2): 67-73
- **INTERACTION FORCE BETWEEN TETRAGONAL DEFECTS AND SCREW DISLOCATIONS IN CUBIC-CRYSTALS** *ACTA METALLURGICA*
  Barnett, D. M., Nix, W. D.
  1973; 21 (8): 1157-1168
- **HIGH-TEMPERATURE CREEP IN FE-3 PCT SI** *METALLURGICAL TRANSACTIONS*
  STANG, R. G., Nix, W. D., Barrett, C. R.
  1973; 4 (7): 1695-1699
- **SOLID-SOLUTION STRENGTHENING IN TI-AL ALLOYS** *METALLURGICAL TRANSACTIONS*
  ROSENBER, H. W., Nix, W. D.
  1973; 4 (5): 1333-1338
- **MODELS FOR GRAIN REARRANGEMENT RESULTING FROM GRAIN-BOUNDARY SLIDING** *PHILOSOPHICAL MAGAZINE*
  Cannon, W. R., Nix, W. D.
  1973; 27 (1): 9-16
- **THERMALLY ACTIVATED DISLOCATION MOTION PAST POINT OBSTACLES INCLUDING EFFECTS OF DISLOCATION SHAPE** *PHYSICA STATUS SOLIDI B-BASIC RESEARCH*
  DiMelfi, R. J., Nix, W. D.
  1973; 58 (1): 331-342
- **EFFECTS OF SHOCK LOADING AND COLD ROLLING ON STRUCTURE AND HIGH-TEMPERATURE CREEP-PROPERTIES OF FE-3.75 PCT SI** *METALLURGICAL TRANSACTIONS*
  Harrigan, W. C., Barrett, C. R., Nix, W. D.
  1973; 4 (6): 1615-1621
- **HIGH-TEMPERATURE DISLOCATION MOBILITIES IN DOPED LIF** *PHILOSOPHICAL MAGAZINE*
  Menezes, R. A., Nix, W. D.
  1973; 27 (5): 1201-1209
- **CREEP IN BINARY SOLID-SOLUTIONS - POSSIBLE EXPLANATION FOR ANOMALOUS BEHAVIOR** *SCRIPTA METALLURGICA*
  Rao, M. V., Nix, W. D.
  1973; 7 (12): 1255-1260
- **COERCIVE FORCE OF IRON RESULTING FROM INTERACTION OF DOMAIN BOUNDARIES WITH LARGE NONMAGNETIC INCLUSIONS** *PHYSICAL REVIEW A-GENERAL PHYSICS*
  Nix, W. D., Huggins, R. A.
  1964; 135 (2A): A401-?
- **DOMAIN CONFIGURATIONS ABOUT NONMAGNETIC PARTICLES IN IRON** *PHYSICAL REVIEW*
  Nix, W. D., Huggins, R. A.

1961; 121 (4): 1038-?