CURRICULUM VITAE: Katherine C. Chen

Materials Engineering Department
California Polytechnic State University
San Luis Obispo, CA 93407
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kcchen@calpoly.edu

EDUCATION

MICHIGAN STATE UNIVERSITY, East Lansing, Michigan
Honors College
B.A. in Chemisty, 1990
B.S. in Materials Science and Engineering, 1990
graduated with highest honor

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, Massachusetts
Department of Defense Graduate Fellowship
Ph.D. in Material Science (Minor in Math), 1996
Thesis entitled "Compositional Influences on the Microstructures, Phase Stability, and Mechanical Properties of $TiCr_2$ Laves Phase Alloys"

EXPERIENCE

CALIFORNIA POLYTECHNIC STATE UNIVERSITY, San Luis Obispo, CA

Associate Professor, Materials Engineering Department	9/02-present
Assistant Professor, Materials Engineering Department	9/99-9/02

MICHIGAN STATE UNIVERSITY, East Lansing, MI

Visiting Scientist, Chemical Engineering and Materials Science Department	7-12/01,6-8/02

LOS ALAMOS NATIONAL LABORATORY, Los Alamos, NM

Visiting Scientist, Material Science and Technology Division: Metallurgy	Summer, 2000
Staff Member, Material Science and Technology Division: Metallurgy	1/98-8/99
Postdoctoral Research Associate, MST Division: Metallurgy Department of Energy (DOE) Q-clearance	10/96-1/98
Volunteer Tutor, Santa Clara Pueblo, Santa Fe Indian School	10/97-6/99

NEW MEXICO TECH, Socorro, NM

Instructor, Materials Engineering Department	Spring, 99

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

Postdoctoral Research Associate, Dept. Materials Science and Engineering	6/96-10/96
Research Assistant, Dept. Materials Science and Engineering	9/90-6/96
Teaching Assistant, Dept. Materials Science and Engineering	Spring, 96
Tutor, Office of Minority Education and Dept. of Material Science and Engineering	1/91-6/94

RESEARCH INTERESTS

Processing-Structure-Property Relationships of Materials; Materials Characterization (x-ray diffraction – XRD, scanning electron microscopy – SEM, transmission electron microscopy – TEM, electron microprobe analysis – EMPA, differential scanning calorimetry – DSC, Fourier transform infrared spectroscopy – FTIR), Defect Structures, Microstructural Evolution, Solidification, Phase Transformations, Mechanical Properties, Deformation Mechanisms, Novel Processing Techniques, Alloy Design and Development, Laves phase intermetallics, solders, shape memory alloys

RESEARCH PROJECTS

Characterization and Development Laves Phase Intermetallics, Los Alamos National Laboratory
Structure-Property Relationships of Shape Memory Alloys, Cal Poly CENG
Thermo-mechanical fatigue of Solder Materials, Michigan State University, NSF
Degradation Mechanisms of Plastic Encapsulated Microcircuits, Lockheed Martin
Structure Determination of NiTi-H Alloys, Nitinol Devices and Components
Development of Rechargeable Gas Mask Filters, Cal Poly subcontract to ONR

CONSULTING AND COLLABORATIONS

Los Alamos National Laboratory, Materials Science and Technology Division, Metallurgy Group, Alloy Design and Development Team
Michigan State University, Materials Science Department, Solder Research group
Sun Microsystems Advanced Technology
Nitinol Devices & Components

PUBLICATIONS

K.C. Chen, L. Christensen, and A. Runciman, "Passport to the Materials World: Materials Engineering Outreach Activities," ASEE Annual Conference Proceedings, 2005.

K.C. Chen, B. London, L. Vanasupa, T.T. Orling, and L. Christensen, "Travelogue from the Materials World: A first week laboratory activity," ASEE Annual Conference Proceedings, 2004.

W.C. Crone, E.J. Voss, and K.C. Chen, "Interactive Demonstrations and Laboratories Using Shape Memory Alloys," ASEE Annual Conference Proceedings, 2004.

K.C. Chen, W.C. Crone, and E.J. Voss, "Shape Memory Alloys for Classroom Demonstrations, Laboratories, and Student Projects," *MRS Symposium Proceedings*, April 2004, and to be published in Journal of Materials Education.

J.G. Lee, K.C. Chen, and K.N. Subramanian, "Formation and Growth of Intermetallics around Metallic Particles in Eutectic Sn-Ag Solder," Journal of Electronic Materials, 33, November 2003, 1240-1248.

H. Rhee, F. Guo, J.G. Lee, K.C. Chen, and K.N. Subramanian, "Effects of Intermetallic Morphology at the Metallic Particle/Solder Interface on Mechanical Properties of Sn-Ag-Based Solder Joints," Journal of Electronic Materials, 33, November 2003, 1257-1264.

L. Vanasupa and K.C. Chen, "MATERIALS SCIENCE AND ENGINEERING IN THE U.S.: *A review of practices and trends*," to be published in Journal of Materials Education, October 2003.

A. R. Pelton, C. Trépanier, X-Y Gong, A. Wick, and K.C. Chen, "Structural And Diffusional Effects Of Hydrogen in TiNi," submitted to Proceedings of the Materials & Processes for Medical Devices Conference, ASM International, September 2003.

K.C. Chen and V. Ravi, "Physical Metallurgy – Providing Unifying Principles in Diverse Areas of Materials Engineering," JOM, TMS, May 2003.

A. R. Pelton, C. Trépanier, X-Y Gong, A. Wick, and K.C. Chen, "Structural And Diffusional Effects Of Hydrogen in TiNi," to be published in Proceedings of the Conference on Shape Memory and Superelastic Technologies,SMST-2003, May 2003.

K.C. Chen, "Entering the Metals Zone," chapter in the textbook, Navigating the Materials World: A guide to understanding materials behavior, ed., C. Baille and L. Vanasupa, Academic Press, 2003.

K.C. Chen, "How we learned to love the phase diagram with a Ti-Cr alloy characterization lab," ASEE Annual Conference Proceedings, 2003.

K.C. Chen, L. Vanasupa, and T. Orling, "A multi-functional Introductory Materials Science course: emphasizing engineering and achieving accreditation objectives," *MRS Symposium Proceedings*, JJ6.4, December 2002, and Journal of Materials Education Vol. 25, No. 1-3, p. 101, 2002.

K.C. Chen, "NiTi – Magic or Phase Transformations?," New Educators Workshop Update 2002: Standard Experiments in Engineering, Materials Science and Technology, 2002.

K.C. Chen, "Metallic Glass: Driving Far from Equilibrium and Returning Back," New Educators Workshop Update 2002: Standard Experiments in Engineering, Materials Science and Technology, 2002.

K.C. Chen, A. Telang, J.G. Lee, and K.N. Subramanian, "Damage Accumulation under Repeated Reverse Stressing of Sn-Ag Solder Joints," Journal of Electronic Materials, November 2002.

R.E. Hackenberg, D.C. Swift, J.C. Cooley, K.C. Chen, D.J. Thoma, D.L. Paisley and A. Hauer, "Phase Changes in Ni-Ti under Laser Shock Loading," International Workshop on New Models and Hydrocodes for Shock Wave Processes in Condensed Matter Proceedings, May 2002.

D.J. Thoma, K.C. Chen, M.I. Baskes, and E.J. Peterson, "The Effect of Stoichiometry in C15 $HfCo_2$," The Fourth Pacific Rim International Conference on Advanced Material and Processing (PRICM 4) Proceedings, *TMS*, 2001.

K.C. Chen, F. Chu, and D.J. Thoma, "$HfCo_2$ Laves Phases Intermetallics Part II: Elastic and Mechanical Properties as a Function of Composition," Intermetallics **9**, 785, 2001.

K.C. Chen, E.J. Peterson, P.G. Kotula, and D.J. Thoma, "$HfCo_2$ Laves Phases Intermetallics Part I: Solubility Limits and Defect Mechanisms," Intermetallics **9**, 771, 2001.

D.J. Thoma, K.A. Nibur, K.C. Chen, J.C. Cooley, L.B. Dauelsberg, W.L Hults, and P.G. Kotula, "The Effect of Alloying on the Properties of (Nb,Ti)Cr_2 *C*15 Laves Phases," to be published in Materials Science and Engineering A.

L. Vanasupa, H. Smith, B. London, K. Chen, D. Niebuhr, L. Griffin, and J. Jones, "The Foundation Series on Corrosion: Integrating Science, Math, Engineering & Technology in a Lab Setting," ASEE Annual Conference Proceedings, 2001.

K.C. Chen and P.T. Adalian Jr., "Incorporating Information Competence into Classes," Impacting Society through Materials Science and Engineering Education, *MRS Symposium Proceedings*, GG6.10, 2001, and in Journal of Material Education, Vol. 23, No. 1-6, p. 143, 2001.

L. Vanasupa and K.C. Chen, "Innovations in Materials Science and Engineering Education: From Wulff to Web," MRS Bulletin Vol. 25, April 2000.

K.C. Chen, P.G. Kotula, F. Chu, and D.J. Thoma, "Microstrucutres and Mechanical Properties of Two-Phase Alloys Based on $NbCr_2$," High-Temperature-Ordered Intermetallic Alloys VIII, *MRS Symposium Proceedings*, Vol. 552, p. KK7.5.1, 1998.

P.G. Kotula, C.B. Carter, K.C. Chen, D.J. Thoma, F. Chu, and T.E. Mitchell, "Defects and Site Occupancies in Nb-Cr-Ti *C*15 Laves Phase Alloys," Scripta Materialia **39**, 619, 1998.

R.H. Hanrahan Jr., K.C. Chen, and M.P. Brady, "The Effects of Beryllium Additions on the Oxidation of Nickel Aluminide and Titanium Aluminide Based Intermetallics," High Temperature Corrosion and Materials Chemistry, P.Y. Hou, M.J. McNallan, R. Oltra, E.J. Opila, and D.A. Shores (Eds.), *ECS*, pp. 458-465, 1998.

K.C. Chen, S.M. Allen, and J.D. Livingston, "Factors Affecting the Room-Temperature Mechanical Properties of $TiCr_2$-base Laves Phase Alloys," Materials Science and Engineering **A242**, 163, 1998.

K.C. Chen, D.J. Thoma, F. Chu, P.G. Kotula, C.M. Cady, G.T. Gray III, P.S. Dunn, D.R. Korzekwa, W.O. Soboyejo, and C. Mercer, "Processing and Properties of Dual Phase Alloys in the Nb-Cr-Ti System," The Third Pacific Rim International Conference on Advanced Material and Processing (PRICM 3) Proceedings, *TMS*, p. 1431, 1998.

K.C. Chen, P.G. Kotula, F. Chu, and D.J. Thoma, "Formation of a Metastable BCC Solid Solution and Decomposition to a *C*15 Laves Phase in Melt-Spun $CrNb_{10}Ti_{10}$," Phase Transformations and Systems Driven Far from Equilibrium, *MRS Symposium Proceedings*, Vol. 481, p. 89, 1997.

D.J. Thoma, F. Chu, P. Peralta, P.G. Kotula, K.C. Chen, and T.E. Mitchell, "Elastic and Mechanical Properties of $Nb(Cr,V)_2$ C15 Laves Phases," Materials Science and Engineering **A239-240**, 251, 1997.

D.J. Thoma, G.K. Lewis, J.O. Milewski, K.C. Chen, and R.B. Nemec, "Rapid Fabrication of Materials Using Directed Light Fabrication," THERMEC '97, 1997.

P.G. Kotula, K.C. Chen, D.J. Thoma, F. Chu, and T.E. Mitchell, "Orientation Relationships in the System Nb-$NbCr_2$," Proceedings of Microscopy and Microanalysis 1997, *EMSA*, 1997.

K.C. Chen, S.M. Allen, and J.D. Livingston, "Assessment of the Compositional Influences on the Toughness of $TiCr_2$-base Laves Phase Alloys," High-Temperature-Ordered Intermetallic Alloys VII, *MRS Symposium Proceedings*, Vol. 460, p. 695, 1996.

K.C. Chen, S.M. Allen, and J.D. Livingston, "Microstructures of Two-Phase Ti-Cr Alloys Containing the $TiCr_2$ Laves Phase Intermetallic," Journal of Materials Research, **12**, 1472, 1997.

K.C. Chen, S.M. Allen, and J.D. Livingston, "Stoichiometry and Alloying Effects on the Phase Stability and Mechanical Properties of $TiCr_2$-base Laves Phase Alloys," High-Temperature-Ordered Intermetallic Alloys VI, *MRS Symposium Proceedings*, Vol. 364, p. 1401, 1994.

K.C. Chen, S.M. Allen, and J.D. Livingston, "Morphology, Deformation, and Defect Strucutres of $TiCr_2$ in Ti-Cr Alloys," High-Temperature-Ordered Intermetallic Alloys VI, *MRS Symposium Proceedings*, Vol. 288, p. 373, 1992.

PRESENTATIONS

International Conference on Materials for Advanced Technologies, Singapore	7/05
American Society for Engineering Education (ASEE), Portland, OR	6/05
The Minerals, Metals, and Materials Society (TMS) Annual Conference, San Francisco, CA	2/05
California Polytechnic State University, Pomona, CA	10/04
American Society for Engineering Education (ASEE), Salt Lake City, UT	6/04
Materials Research Society (MRS) Spring Meeting, San Francisco, CA	4/04
American Society for Engineering Education (ASEE), Nashville, TN	6/03
Materials Research Society (MRS) Fall Meeting, Boston, MA	12/02
National Educators Workshop: Update 2002, San Jose, CA	10/02
American Society for Engineering Education (ASEE), Montreal, Quebec	6/02
The Minerals, Metals, and Materials Society (TMS) Annual Conference, Seattle, WA	2/02
Materials Research Society (MRS) Spring Meeting, San Francisco, CA	4/01
TMS Annual Conference, New Orleans, LA	2/01
Cal Poly Physics Colloquium, San Luis Obispo, CA	11/00
American Society for Engineering Education (ASEE), St. Louis, MO	6/00
TMS Annual Conference, San Diego, CA	3/99
California Polytechnic State University, San Luis Obispo, CA	2/99
Wayne State University, Detroit, MI	1/99
MRS Fall Meeting, Boston, MA	12/98
Third Pacific Rim Int. Conf. Advanced Materials and Processing (PRICM/TMS), Honolulu, HI	7/98
University of California, Los Angeles (UCLA), CA	5/98
Engineering Foundation Conference on Nonstoichiometric Intermetallics, Kona, HI (poster)	4/98
Illinois Institute of Technology, Chicago, IL	3/98
Arizona State University, Tempe, AZ	3/98
Wayne State University, Detroit, MI	2/98

TMS Annual Meeting, San Antonio, TX	2/98
MRS Fall Meeting, Boston, MA (poster)	12/97
Brown University, Providence, RI	5/97
General Motors, Research and Development Technology Center, Detroit, MI	2/97
MRS Fall Meeting, Boston, MA	12/96
Gordon Conference on Physical Metallurgy, Holderness, NH (poster)	7/96
Los Alamos National Laboratory, Los Alamos, NM	5/96
Harvard University, Materials Science Seminar, Cambridge, MA	2/96
Rome Air Force Laboratory, Hanscom AF Base, MA	12/95
MRS Fall Meeting, Boston, MA	12/94
MRS Fall Meeting, Boston, MA (poster)	12/92

PROFESSIONAL SOCIETIES and ACTIVITIES

American Society for Materials (ASM International): Cal Poly Student Chapter Faculty Advisor
The Minerals, Metals, and Materials Society (TMS): Cal Poly Student Chapter Faculty Advisor
Young Leaders Intern 2000
Structural Materials Division Representative for Student Affairs
Structural Materials Committee
Physical Metallurgy Committee: JOM editor
Materials Research Society (MRS): Academic Affairs Committee, chair of University Chapters
Cal Poly Student Chapter Faculty Advisor
American Society for Engineering Education (ASEE)
The American Ceramic Society (ACerS)
Society of Women Engineers (SWE)
Engineers for a Sustainable World (ESW)
American Association for the Advancement of Science (AAAS)
Council for Undergraduate Research (CUR)
Tau Beta Pi Engineering Honor Society
Alpha Sigma Mu Materials Honor Society: Cal Poly Student Chapter Faculty Advisor
Phi Kappa Phi Honor Society
Mortar Board Honor Society
Sigma Xi Research Honor Society

CAL POLY DUTIES

Faculty Advisor to Materials Research Society (MRS) University Chapter, 1999-2004
AMS-TMS Student Chapter, 1999-2004
Alpha Sigma Mu Materials Honor Society, 2000-present
Cal Poly Salsa Dance Club, 2000-2004
Society of Women Engineers (SWE) Team Tech, 2003-2004
Society of Women Engineers (SWE) Cal Poly student chapter, 2004-present
MATE Department Outreach Coordinator, 1999-present
MATE Fee Initiative Committee, 2002-present
Status of Women Committee (CENG representative), 2001-present
Technology Park Academic Advisory Committee, 2004-present
Women in Science and Technology Lecture Series Committee, 2000-2001.

HONORS AND AWARDS

Lockheed Martin Endowed Professorship, CENG, 2004-2006
Northrop Grumman Excellence in Teaching Award, CENG, May 2003
Most Supportive Professor Award, Cal Poly SWE, 2003
Outstanding Faculty Advisor Award, Cal Poly Engineering Student Council, May 2001
Los Alamos National Laboratory Teamwork Award, Sept. 1999