U. Fred Kocks
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VITA (December 2003)

Personal

Born 25 November 1929 in Düsseldorf, Germany
U.S. resident since 1955, citizen since 1962
Married (Marianne), 4 children.

Education

Technische Hochschule Stuttgart, Germany (Physics)	1949-52 (B.S.)
Universität Göttingen, Germany (Theoretical Physics)	1952-54 (Diplom)
Harvard University (Applied Physics, Phys. Metallurgy)	1955-59 (Ph.D.)

Employment History

Harvard University, Division of Engineering and Applied Physics
Lecturer 1959-61, Asst. Prof. 1961-65
Argonne National Laboratory, Materials Science and Technology Division
Associate Metallurgist 1965-70, Senior Metallurgist 1970-83
Group Leader (Mechanical Properties) 1967-79
Los Alamos National Laboratory
Center for Materials Science: Technical Staff Member 1983-, Laboratory Fellow 1986-
Materials Science and Technology Division (MST-8): Retired Fellow 1998-present

Visiting Professor:

1964: Technische Universität München, Germany
1971/72: Technische Hochschule Aachen, Germany
1978: McMaster Universitty, Hamilton, Ont., Canada
1979: Technische Hochschule Aachen. Germany
1982: McGill University, Montreal, Que., Canada

Guest Lecturer (short courses):

1969: University of Brit. Columbia, Vancouver, BC, Canada
1974: Escuela Latino-Americano de Fisica, Mexico
1975: Tampere Univerity of Technology, Finland
1975: University of California, Berkeley
1984: Centro Atomico, Buenos Aires, Argentina

Honors

1979: Alexander-von-Humboldt Award of the Federal Republic of Germany
1982: Doctor of Technology honoris causa, Tampere University of Technology, Finland
1985: Senior Scientist Award, Japan Society for the Promotion of Science
1977: Chairman, Gordon Conference on Physical Metallurgy
1987: elected Fellow of TMS (The Metallurgical Society of AIME, now "The Minerals, Metals, and Materials Society")
1993: elected Fellow of the American Society for Metals (now ASM International)
1999: elected to the U.S. National Academy of Engineering

U.F. Kocks Publications

Books and book chapters:

1975: Kocks, Argon and Ashby: "The Thermodynmaics and Kinetics of Slip": *Prog.Mater.Sci.***19**

1981: "Kinetics of Non-Uniform Deformation": *Prog.Mater.Sci.* **Chalmers Anniv. Volume**

1987: "Constitutive Behavior Based on Crystal Plasticity": in *Unified Constitutive Equations for Creep and Plasticity*, A.K. Miller,ed. (Elsevier Applied Science) 1-88

1998: Kocks, Tomé and Wenk, eds.: *Texture and Anisotropy* (Cambridge)

- in the above, by Kocks:
- Chapter 1, "Anisotropy and Symmetry", pp.10-43
- Chapter 2: "The Representation of Orientations and Textures", pp. 44-101
- Chapter 8: "Kinematics and Kinetics of Plasticity", pp.326-389
- Chapter 9: "Simulation of Deformation Textures for Cubic Metals", pp.390-419
- Chapter 10: M.G. Stout and Kocks: "Effects of Texture on Plasticity", pp.420-465

2003: "The Physics and Phenomenology of Strain Hardening" (with Mecking): *Prog.Mater.Sci.* **48(3),** 171-273.

Software Packages:

popLA: "Preferred Orientation Package – Los Alamos" (U.F. Kocks, J.S. Kallend, H.-R.Wenk. A.D. Rollett, and S.I. Wright: LA-CC ; last version October 1995)

— This was a DOS-version; a JAVA version is under development by A.D. Rollett (2004).

LApp: "Los Alamos Polycrystal Plasticity" (U.F. Kocks, G.R. Canova, C.N.Tomé, A.D. Rollett, S.I. Wright: LA-CC-88-6; last version 30 April 1996)

Selected papers: (166 total)

1958:"Polyslip in Polycrystals": *Acta Metall.* **6**, 85-94

1960:"Polyslip in Single Crystals": *Acta Metall.* **8**, 345-352

1966: "Latent Hardening in Aluminum" (with T.J. Brown): *Acta Metall.* **14**, 87-98

1966: "A Statistical Theory of Flow Stress and Work Hardening": *Phil.Mag.* **13**, 541-566

1970: "The Relation between Polycrystal Deformation and Single Crystal Deformation": *Metall. Trans.* **1**, 1121-43

1976: "Laws for Work Hardening and Low-temperature Creep": *J. Eng. Mater.&Tech.* **98**, 76-85

1979: "The Development of Strain-Rate Gradients" (with Jonas and Mecking): *Acta Metall.* **27**, 419-432

1979: Hasegawa & Kocks, "Thermal Recovery Processes in Deformed Aluminum": *Acta Metall.* **27**, 1705-16

1979 "A Mechanism for Static and Dynamic Recovery" (with Mecking): *Fifth Int.Conf. on the Stength of Metals and Alloys*, P. Haasen, V. Gerold and G. Kostorz, eds. (Pergamon) 511-516

1981: H.Mecking & U.F. Kocks, "Kinetics of Flow and Strain-Hardening": *Acta Metall.* **29**, 1865-75

1985: "Dislocation Interactions: Flow Stress and Strain Hardening": in *Dislocations and Properties of Real Materials* (London; Institute of Metals)

1985: G. Canova, Kocks, C. Tomé, and Jonas "The Yield Surface of Textured Polycrystals": *J. Mech. Phys. Sol.* **33**, 371-397

1985: "Kinetics of Solution Hardening": *Metall. Trans.* **16A**, 2109-2130

1987: G. Regazzoni, Kocks and P. Follansbee, "Dislocation Kinetics at High Strain Rates": Acta Metall. 35, 2865-2875

1988: P.S. Follansbee & Kocks, "A Constitutive Description of the Deformation of Copper Based on the Use of Mechanical Threshold Stress as an Internal State Variable": *Acta Metall.* **36**, 81-93

1991: “A Forest Model of Latent Hardening and its Application to Polycrystal Deformation” (with Franciosi and Kawai): in *Ninth Int. Conf. on Textures of Materials*, Bunge, Esling, Penelle,eds. (Gordon & Breach) 1103-1114

1991: S.-R Chen & Kocks: “High-temperature Plasticity in Copper Polycrystals”: in *High-temperature Constitutive Modeling: Theory and Application*, Freed & Walker, eds. (ASME) 1-12

1993: “Constitutive Laws for Deformation and Dynamic Recrystallization in Cubic Metals” (with S.R. Chen): in *Aspects of High-temperature Deformation and Fracture in Crystalline Materials,* Y. Hosoi et al., eds. (Jap. Inst.Metals) 593-600.

1994: “Kinematics of Plasticity related to the state and evolution of the material microstructure” (with P.R. Dawson and C. Fressengeas): *J.Mech Behavior of Materials* **5(2)**, 107-128.

1996: “ Development of Localized Orientation Gradients in FCC Polycrystals” (by A.J. Beaudoin, H. Mecking, and U.F. Kocks): *Philos. Mag.* **A73**, 1503-1517.

1998: “Solute Drag as an Upper Bound to High-temperature Strength”: *Scripta Materialia* **39**, 431-436.