

CURRICULUM VITAE:

MINGWEI CHEN, Ph.D

Professor

Institute for Materials Research (IMR), Tohoku University

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EDUCATION:

May /1995 **Ph.D., Major: Materials Science and Engineering**
Shanghai Jiao Tong University, P. R. China.

Sept. /1991 **Master of Engineering, Major: Materials Science and Engineering**
Taiyuan University of Technology, P. R. China

Aug. /1988 **Bachelor of Engineering, Major: Metals and heat treatment**
China University of Mining and Technology, P. R. China.

EXPERIENCE:

Nov./03-present **Institute for Materials Research (IMR), Tohoku University, Japan**
Professor

Sept/00-present **Johns Hopkins University, Baltimore, MD, USA**
Visiting Professor (2004~)
Associate Research Professor (2003-)
Research Associate (2000-2002)

Aug/99-Aug/00 **Naval Postgraduate School, Monterey, CA, USA**
National Research Council (NRC) Fellow

June/97-Aug/99 **Institute for Materials Research (IMR), Tohoku University, Sendai, Japan.**
Guest Researcher/COE Fellow

May. /95-Jun/97 **Shanghai Jiao Tong University, Shanghai, P. R. China**
Postdoc Fellow/Associate Professor in Dept. of Materials Science

**HONORS AND
AWARDS:**

1. Paul A. Siple Memorial Award for Army Research Achievements, U. S. Army, 2006.
2. Best Paper Award of 25th U.S. Army Science Conference, 2006.
3. Best Reviewer Award of Scripta Materialia and Acta Materialia, 2006.
4. Mitsubishi Science Foundation Award, 2005.
5. Japan Society for Promotion of Science (JSPS) Grant-in-Aid for Scientific Research, 2004.
6. Best Paper Award of Japanese Institute of Metals (JIM), 2000.
7. National Research Council Associateship Award from the National Academy of Sciences, USA, 1999.
8. Best Paper Award of Chinese Mechanical Engineering Society (CMES), 1996.
9. Excellent Graduate Award of Shanghai, 1995.
10. Best Paper Award of Chinese Metal Heat Treatment Society, 1994.

**PROFESSIONAL
SERVICE:**

Editorial Advisory Board: Metallurgical and Materials Transactions A (key reader).
Reviewer: Nature Materials, Science, Nature, Journal of American Chemical Society, Applied Physics Letters, Journal of Applied Physics, Acta Materialia, Scripta Materialia, Journal of

Materials Science, Materials Letters, Journal of Crystal Growth, Journal of Electron Microscopy.

COMPETING GRANTS RECEIVED:

- (1) “Experimental Characterization of Dislocation Core Structure in bcc metals”, AFOSR, 11/2001~10/2004, \$380,000, Co-PI with Prof. K. Hemker.
- (2) “Microstructural characterization of armor grade boron carbide”, U. S. Army Research Lab, 06/2002 ~12/2003, \$75,000, PI with Prof. Hemker (co-PI)
- (3) “High pressure induced nano-scale phase transitions in high strength ceramics”, Grand-in-aid-A, Japan Society for Promotion of Science, 2004-2007, JPY 48,860,000, PI.
- (4) “Synthesizing mesoporous transition metals” , Mitsubishi Foundation, 2005-2007, JPY 7,000,000, PI.
- (5) “Correlation between mechanical properties and electron/atomic structures in bulk metallic glasses”, Tohoku-Osaka Metallic Glass Center, 2005-2007, JPY20,000,000, PI
- (6) “TEM characterization of high performance armor ceramics”, 01/2004-12/2007, U.S. Army Research Lab, total \$292,000, PI.
- (7) “Interfacial creep in thin film interconnect structures in micro-systems”, U. S. National Science Foundation (NSF), 2005-2008, \$400,665, Co-PI with Prof. I. Dutta at Naval Postgraduate School, California.
- (8) “Functionalized nanoporous metals”, Award from Mazuda Science Foundation, 2005-2006, JPY 2,000,000, PI.
- (9) “High-pressure phase transitions of superhard materials”, 2005-2006, Grant-in-Aid for Award Research, Japan Society for Promotion of Science, JPY 2,400,000, PI.
- (10) “Nanomechanics of bulk metallic glasses”, 2006-2007, Grant-in-Aid for Scientific Research in Priority Areas: Materials Science of Bulk metallic glasses, MEXT of Japan, JPY6,700,000, PI.
- (11) “Development and characterization of nanoporous transition metals”, 2006-2007, Grant-in-Aid for Explore Research, Japan Society for Promotion of Science, JPY4,700,000, PI.
- (12) “Developing ultrahigh strength and ductile nanocrystalline metals”, 2006-2007, Tohoku Specially Promoted Research, JPY10,000,000, PI.

CLASSES

- (1) Nanostructured Materials and Nanotechnology (Tohoku University).
- (2) Transmission Electron Microscopy (JHU).

PUBLICATIONS:

(1) Invited Review Articles

1. M. W. Chen, E. Ma, K. J. Hemker, Mechanical behavior of nanocrystalline metals, in *Nanomaterials Handbook*, CRC Publisher, 2006.

2. M. W. Chen, Deformation mechanisms of bulk metallic glasses, *Annual Review of Materials Science*, 2007, in press.

(2) Journal articles:

1. T. Fujita, M. W. Chen, X. M. Wang, B. S. Xu, K. Inok, and K. Yamamoto
Electron holography of single crystal iron nano-rods encapsulated in carbon nanotubes
J. Appl. Phys., 2007, vol. 101, 014323.
2. M. W. Chen, J. W. McCauley
Mechanical scratching induced reactions and phase transitions of boron carbide
J. Appl. Phys., 2006, vol. 100, 123537.
3. M. W. Chen, J. W. McCauley, D. P. Dandekar, N. K. Bourne
Dynamic plasticity and failure of high purity alumina
Nature Materials, 2006, vol. 5, 614.
4. M.W. Chen, A. Inoue, W. Zhang, T. Sakurai
Extraordinary plasticity of ductile bulk metallic glasses
Phys. Rev. Lett., 2006, vol. 96, 245502.
5. K. Wang, D. Pan, M. W. Chen, W. Zhang, A. Inoue
Measuring elastic energy density of bulk metallic glasses by nanoindentation
Mater. Trans., 2006, vol. 47, 1981.
6. D. Pan, T. G. Nieh, and M. W. Chen
Strengthening and softening of nanocrystalline Ni during multi-step nanolindentation
Appl. Phys. Lett., 2006, vol.88, 16192
7. X. Q. Yan, W. J. Li, T. Goto, and M. W. Chen
Raman spectroscopy of pressure-induced amorphous boron carbide
Appl. Phys. Lett., 2006, vol. Vol.88, 131905
8. X. M. Huang, K. H. Wu, M. W. Chen, T. Toshinori, K. Hoshikawa, S. Koh, S. Uda
Temperature dependence of Raman scattering in Si crystals with heavy B and/or Ge doping
Mater. Sci. in Semiconductor Processing, 2006, vol. 9, 257.
9. X. L. Wu, Y. T. Zhu, M. W. Chen, E. Ma
Twinning and stacking fault formation during tensile deformation of nanocrystalline Ni
Scripta Mater. 2006, vol. 54, 1685.
10. H. T. Zhang, M. W. Chen, K. T. Ramesh, J. Ye, J. M. Schoenung, E.S.C. Chin
Tensile behavior and dynamic failure of Al6092/B4C Composites
Mater. Sci. Eng. 2006, A433, 70
11. X. Q. Yan, X. M. Huang, S. Uda, and M. W. Chen
Effect of heavy boron doping on pressure-induced phase transitions in silicon
Appl. Phys. Lett., 2005, 87, 191911.
12. M. W. Chen and X. Q. Yan
Comment on “Grain boundary mediated plasticity in nanocrystalline nickel”
Science, 2005, vol.308, 356c.
13. Yi Ding, Anant Mathur, M. W. Chen, and Jonah Erlebacher
Epitaxial Casting of Nanotubular Mesoporous Platinum
Angewandte Chemie international edition, 2005, vol. 117, 2
14. M. W. Chen, A. Inoue, T. Sakurai, E. S. K. Menon, R. Nagarajan, and I. Dutta
Redistributions of alloying elements in quasicrystallized Zr-Al-Ni-Cu-Ag bulk metallic glass
Phys. Rev. B, 2005, vol 71, 092202
15. M. W. Chen, J. W. McCauley and K. J. Hemker
Microstructural characterization of commercial hot-pressed boron carbide ceramics
J. Amer. Ceram. Soc., 2005, vol. 88, 1935.
16. K. A. Peterson, I. Dutta and M.W. Chen
Processing and characterization of diffusion-bonded Al-Si interface
J. of Mater. Proc. and Tech., 2004, Vol.145, 99.
17. X. M. Huang, S. J. Koh, K. H. Wu, M. W. Chen, T. Hoshikawa, K. Hoshikawa, S. Uda
Reaction at the interface between Si melt and a Ba-doped silica crucible

- J. of Crystal Growth*, 2005, vol. 308, 5720.
18. B. S. Xu, P. Han, J. Liang, X. G. Liu, H. Q. Bao, T. B. Li, **M. W. Chen**
Theoretical investigation of the reflectivity of fullerene-(C-60, C-70)/AlN multilayers in UV region
Solid State Communications, 2005, Vol. 133, 353-356
 19. Y. Ding, **M. W. Chen** and J. Erlebacher
Metallic Mesoporous Nanocomposite Materials for Electrocatalysis
J. Amer. Chem. Soc. vol 126, 6876(2004)
 20. M. L. Glynn, **M. W. Chen**, K. T. Ramesh, and K. J. Hemker
Influence of martensitic transformation on the stress development in thermal barrier coating systems
Mater. Metall., Trans. A, 2004, vol. 35A, 2279 (2004).
 21. **M. W. Chen**, E. Ma, K. J. Hemker, H. Sheng, Y. M. Wang and X. M. Cheng
Deformation twinning in nanocrystalline aluminum
Science, 2003, vol. 300, 1275; *Science Express*, April 27th, 2003.
 22. **M. W. Chen**, K. Livi, K. P. Wright, and K. J. Hemker
Microstructural Characterization of Pt Modified Aluminide Bond Coat for TBC
Metall. Mater. Trans., 2003, 34 A, 2289
 23. K. A. Peterson, I. Dutta and **M. W. Chen**
Diffusionally Accommodated Interfacial Sliding in Metal-Silicon Systems
Acta Mater., 2003, vol. 51, 2831.
 24. **M. W. Chen**, J. W. McCauley, and K. J. Hemker
Shock induced localized amorphization in boron carbide
Science, 2003, vol. 299, 1563.
 25. Y. M. Wang, **M. W. Chen**, F. H. Zhou and E. Ma
Extraordinarily high tensile ductility in a nanostructured metal
Nature, 2003, vol. 419, 912
 26. **M. W. Chen**, M. Glynn, R. T. Ott, T. C. Hufnagel, and K. J. Hemker
Martensitic transformation and transformation strain in a thermally cycled a Platinum modified diffusion aluminide bond coat.
Acta Mater., 2003, vol. 51, 4279.
 27. D. Pan, **M. W. Chen**, P. K. Wright and K. T. Hemker
Evolution of Diffusion Aluminide Bond Coat for Thermal Barrier Coatings during Thermal Cycling
Acta Mater., 2003, vol. 51, 2205.
 28. Y. M. Wang, **M. W. Chen**, H. W. Sheng and E. Ma
Nanocrystalline grain structures developed in commercial purity Cu by low temperature cold rolling
J. Mater. Res. 2002, Vol. 17, 3004.
 29. K. A. Peterson, I. Dutta, and **M. W. Chen**
Measurement of Creep Kinetics at Al-Si Interfaces
Scripta Mater. 2002, Vol. 47, 649.
 30. **M. W. Chen**, R. T. Otta, T. C. Hufnagel, K. J. Hemker
Microstructural Evolution in a Pt modified Diffusion Aluminid Bond Coat
Surface and Coating Technology, 2003, Vol. 163-164, 25.
 31. Y. Wang, E. Ma, **M. W. Chen**
Enhanced Tensile Ductility in Nanostructured Cu
Appl. Phys. Lett., 2002, Vol. 80, 2395.
 32. L. M. Wang, L. Q. Ma, **M. W. Chen**, H. Kimura, and A. Inoue
Annealing Embrittlement of Al₈₉Fe₁₀Zr₁ amorphous alloy
Mater. Sci. and Eng. A., 2002, Vol. 325, 182.
 33. M. W. Chen, I. Dutta, T. Zhang, A. Inoue, and T. Sakurai
Kinetic evidence on the structure similarity between supercooled liquid and icosahedral phase.
Appl. Phys. Lett., 2001, Vol. 79, 1:42
 34. I. Dutta, **M. W. Chen**, K. A. Peterson, and T. Shultz

- Plastic deformation and interfacial sliding in Al and Cu thin film: Si substrate Systems Due to Thermally cycling
J. Electronic Materials, 2001, Vol. 30, 12: 1537.
35. **M. W. Chen** and I. Dutta
 Atomic force microscopy study of plastic deformation and interfacial sliding in Al film: Si substrate systems due to thermal cycling
Appl. Phys. Lett. 2000, Vol. 77, 26: 4298.
 36. M. W. Chen, A. Inoue, T. Zhang, A. Sakai, and T. Sakurai
 Formation of quasicrystals in an annealed ZrAlNiCuAg bulk metallic glass
Phil. Mag. Lett., 2000, Vol. 80, 4:263.
 37. **M. W. Chen**, A. Sakai, A. Inoue, X. M. Wang, and T. Sakurai
 Partitioning of Al in a nanocrystalline FeZrBAl soft magnet.
J. Appl. Phys., 2000, Vol. 87, 1: 439.
 38. M. Matsushita, J. Saida, T. Zhang, A. Inoue, **M. W. Chen**, and T. Sakurai
 Grain growth behavior of quasicrystals from the supercooled liquid region of $Zr_{65}Cu_{7.5}Al_{7.5}Ni_{10}Ag_{10}$
Phil. Mag. Lett., 2000, Vol.80, 2: 79.
 39. A. Inoue, T. Zhang, **M. W. Chen**, T. Sakurai, M. Matsushita, J. Saida
 Ductile quasicrystalline alloys
Appl. Phys. Lett., 2000, Vol. 76, 8: 976.
 40. **M. W. Chen**, A. Inoue, T. Zhang, A. Sakai, and T. Sakurai
 Quasicrystals and nano-quasicrystals in Zr-based bulk metallic glasses.
Intermetallics, 2000, Vol. 8, 5: 39.
 41. **M. W. Chen**, A. Sakai, A. Inoue, X. M. Wang, and T. Sakurai
 Distribution of alloying elements in a $Nd_2Fe_{14}B/\alpha\text{-Fe}$ nanocomposite
J. Appl. Phys., 2000, Vol. 88, 11: 6928.
 42. **M. W. Chen**, X. M. Wang, A. Sakai, A. Inoue, and T. Sakurai
 Microstructure investigation of an annealed amorphous Fe-C-Si-B cast iron.
Scripta Mater., 2000, Vol. 43:1021
 43. **M. W. Chen**, A. Inoue, T. Sakurai, D. H. Ping, and K. Hono
 Impurity oxygen redistribution in a nanocrystallized ZrCuAlPd metallic glass.
Appl. Phys. Lett., 1999, Vol. 74, 6: 812.
 44. **M. W. Chen**, A. Inoue, C. Fan, A. Sakai, and T. Sakurai
 Fracture behavior of a nanocrystallized ZrCuAlPd metallic glass
Appl. Phys. Lett., 1999, Vol. 74, 15: 2131.
 45. **M. W. Chen**, T. Zhang, A. Inoue, A. Sakai, and T. Sakurai
 Quasicrystals in a partially devitrified ZrAlNiCuAg bulk metallic glass
Appl. Phys. Lett., 1999, Vol. 75, 12: 1697.
 46. J. Saida, M. Matsushita, T. Zhang, A. Inoue, **M. W. Chen**, and T. Sakurai
 Precipitation of icosahedral phase from a supercooled liquid region in $Zr_{65}Cu_{7.5}Al_{7.5}Ni_{10}Ag_{10}$ metallic glass
Appl. Phys. Lett., 1999, Vol. 75, 22: 3497.
 47. A. Inoue, T. Zhang, J. Saida, M. Matsushita, **M. W. Chen**, and T. Sakurai
 Formation of icosahedral quasicrystalline phase in Zr-Al-Ni-Cu-M (M=Ag, Pd, Au, or Pt) systems
Mater. Trans., JIM, 1999, Vol. 40, 10: 1181.
 48. A. Inoue, T. Zhang, J. Saida, M. Matsushita, **M. W. Chen**, and T. Sakurai
 High strength and good ductility of bulk quasicrystalline base alloy in $Zr_{65}Al_{7.5}Ni_{10}Cu_{17.5-x}Pd_x$ system
Mater. Trans., JIM, 1999, Vol. 40, 10: 1137.
 49. **Mingwei Chen**, Dongliang Lin, C. T. Liu
 Influence of strain rate on fracture mode of a polycrystalline Ni3Al alloy
Scripta Materialia, 1998, Vol: 38, 2:293
 50. **Mingwei Chen**, Dongliang Lin and Da Chen,
 Influence of lamellar orientation on crack propagation in gamma based TiAl alloys,
Scripta Materialia, 1997, Vol. 36, 5: 497

51. **Mingwei Chen**, Dongliang Lin and C. T. Liu
Strian rate sensitivity of ductility of a Fe3Al alloy deformed under tensile impact,
Scripta Materialia, 1997, vol. 37, 8: 1243
52. **Mingwei Chen**, Dongliang Lin and C. T. Liu
Strain rate sensitivity of mechanical properties and fracture behavior in a Fe-28Al alloy
Materials Science and Engineering, 1997, Vol. 239/240: 317.
53. **Mingwei Chen**, Dongliang Lin, Baode Sun and Da Chen
TEM observation of modulated structure in a rapidly solidified NiAl alloy
Chinese Science Bulletin(in Chinese), 1997, 42: 1219
54. **Mingwei Chen**, Da Chen, Dening Wang and Dongliang Lin
In-situ straining TEM observation of dislocation motion in PST crystal of TiAl
The Chinese Journal of Nonferrous Metals (in Chinese),1997, 3: 67
55. Dongliang Lin, Aidang Shan and **Mingwei Chen**,
Superplasticity of Large-grained Fe3Al alloys,
Intermetallics, 1996, 4:489.
56. **Mingwei Chen**, Da Chen and Dongliang Lin,
Modulation structure in a rapidly solidified Ni-47Al Alloy,
Materials Letters, 1996,28:153
57. Dongliang Lin, Yun Zhang, **Mingwei Chen** and Hui Lin,
Deformation and fracture of a directional solidification Ni3Al,
Materials Science and Engineering, 1995, A192/193:647.
58. Aidang Shan, **Mingwei Chen** and Dongliang Lin,
Superplasticity with large grains a Fe3Al-Ti alloy,
Acta Metallurgica Sinica (in Chinese), 1995, 1: B38.
59. **Mingwei Chen**, Aidang Shan and Dongliang Lin,
Phenomenon of *in situ* recrystallization during high-temperature deformation in a
Fe3Al based alloy,
Acta Metallurgica Sinica, 1995,4:A169.
60. **Mingwei Chen**, Aidang Shan and Dongliang Lin,
The evolution of the grain configuration in a Fe3Al-Ti alloy during superplastic
deformation,
Transactions of Metal Heat Treatment(in Chinese), 1995, 2: 41.
61. **Mingwei Chen**, Aidang Shan and Dongliang Lin,
The evolution of dislocation structure during superplastic deformation in a hot-rolled
Fe3Al alloy,
Transaction of Metal Heat Treatment (in Chinese), 1995, 3: 9.
62. **Mingwei Chen**, Dongliang Lin, Aidang Shan,
TEM analysis of superdislocation structure around a crack tip in a directionally
solidified Ni3Al alloy,
Acta Metallurgica Sinica(in Chinese), 1995, 7: S429.
63. Donglian Lin, Aidang Shan and **Mingwei Chen**,
Superplasticity of Fe3Al with large grains,
Acta Metall. Sinica(in Chinese), 1995,4:419.
64. **Mingwei Chen** and Zengshou Hou,
Technology of delaying quenching after forging,
Heat Treatment of Metals (in Chinese), 1995, 4: 26.
65. **Mingwei Chen** and Dongliang Lin,
In Situ TEM observation of {110} cleavage in Ni3Al with charging hydrogen,
Acta Metallurgical Sinica (in Chinese), 1994, 7: A331.
66. **Mingwei Chen**, Da Chen and Dongliang Lin,
Influence of lamellar structure on crack propagation in a duplex TiAl alloy,
Acta Metallurgica Sinica (in Chinese), 1994, 9: A421.
67. **Mingwei Chen** and Dongliang Lin,
The theory of normal grain growth during continuous cooling,
Transactions of Metal Heat Treatment (in Chinese), 1994,2:18.
68. Dongliang Lin, **Mingwei Chen** and Aidang Shan,

The evolution of microstructure in a hot-rolled Fe₃Al during superplastic deformation,
Materials Science Forum, 1994, Vol. 170/172:477

69. Aidang Shan, Mingwei Chen and Dongliang Lin,
Superplasticity in Fe₃Al based alloys,
Materials Science Forum, 1994, Vol. 170/172:489