Summary of Experience Record

NASR M. GHONIEM

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Contents

1 CONTACT, PREPARATION & APPOINTMENTS

1.1 CONTACT INFORMATION

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1.2 PROFESSIONAL PREPARATION

- B.S. University of Alexandria, Egypt, Dept. of Nuclear Engineering (1971)
- M.Eng. McMaster University, Canada, Dept. of Engineering Physics (1974)
- M.S. University of Wisconsin, USA, Dept. of Nuclear Engineering (1975)
- Ph.D. University of Wisconsin, USA, Dept. of Nuclear Engineering (1977)

1.3 APPOINTMENTS

- **Distinguished Research Prof,** Mechanical & Aerospace Engr. Dept., UCLA (20-)
- **UC Distinguished Professor,** Mechanical & Aerospace Engr. Dept., UCLA (06-20)
- **Vice Chair,** Mechanical & Aerospace Engr. Dept., UCLA (00-06)
- **Professor,** Materials Science & Engr. Dept., UCLA (2002-)
- **Associate Professor,** Mechanical & Aerospace Engr. Dept., UCLA (82-86)
- **Assistant Professor,** Mechanical & Aerospace Engr. Dept., UCLA (77-82)

2 HONORS, AWARDS, & PROFESSIONAL ACTIVITIES

2.1 HONORS & AWARDS

- Lifetime Achievement Award, Egyptian-American Organization (2018)
- Fellow of the Materials Research Society. (2014)
- Fellow of the American Academy of Mechanics. (2010)
- Lifetime Achievement Award of the International Conference on Multi-scale Modeling of Materials. (2008)
- Int. Symposium on Defect Mechanics in Honor of 60th Birthday, 4^{th} Inter. Conf. on Multiscale Modeling, Tallahasse, Fl. (2008)
- Outstanding Achievement Award of the Materials Science Division of ANS. (2007)
- Fellow of the American Society of Mechanical Engineers (ASME). (2006)
- General Chair: 2^{nd} Int. Conf. on Multiscale Materials Modeling (MMM-2). (2004)
- UCLA Faculty/ Staff Partnership Award. (2003)
- Royal Society of London Visiting Professorship in Hong Kong. (2000)
- Fellow of the Japan Society for the Promotion of Science (JSPS). (1999)
- Outstanding Achievement Award of the Fusion Energy Division of ANS. (1998)
- Fellow of the American Nuclear Society (ANS). (1994)
- Who's Who in Frontier Science and Technology. (1983)
- Outstanding Young Man of America Award. (1978)
- Inventor of low-activation ferritic steels, (U.S. Patent No. 4,622,067). (1986)
- Founder of Dislocation Dynamics for microplasticity. (1987)

2.2 PROFESSIONAL ACTIVITIES

- **Member:** The American Nuclear Society (ANS), the American Academy of Mechanics, the Materials Research Society (MRS); The American Society for Mechanical Engineers (ASME), and the American Physical Society (APS).
- **Associate Editor**:
  1. Defect and Diffusion Forum, Scitec Publishers.
  2. Solid State Phenomena, Scitec Publishers.
- **Editorial Boards:**
  1. Journal of the Mechanical Behavior of Materials (JMBM)
  2. Journal of Computational Methods in Engineering Science (CMES)
  3. Journal of Computational and Theoretical Nano Science (JCTNS)
  4. International Journal of Materials & Mechanics in Design (Kluwer)
  5. Guest Editor, Journal of Computer Aided Material Design (JCAD)
  6. Guest Editor, Materials Research Society Proceedings (MRS)
  7. Guest Editor, Philosophical Magazine (Phil Mag)
  8. Guest Editor, Vacuum

3 RESEARCH & PUBLICATIONS

≈ 400 publications (≈ 330 refereed journal articles), ≈ 10,000 Google Scholar citations; h-index=52, i10-index=203.
Research Interests: Damage and Failure of Materials in Mechanical Design; Mechanics and Physics of Material Defects (point defects, dislocations, voids and cracks); Material Degradation in Severe Environments (e.g. Nuclear, Fusion, Rocket Engines, etc.); Plasma and Laser Processing; Materials Non-equilibrium, Pattern formation and Instability Phenomena; Radiation Interaction with Materials (neutrons, electrons, particles, laser & photons): see: http://matrix.seas.ucla.edu

3.1 BOOKS

1. Ghoniem, N.M. and Walgraef, D., "Instabilities and Self-Organization in Materials, Volume I", Fundamentals of Nanoscience, Oxford University Press, I:1 - 548 (March 2008).
2. Ghoniem, N.M. and Walgraef, D., "Instabilities and Self-Organization in Materials, Volume II", Applications in Materials Design and Nanotechnology, Oxford University Press, II:549 - 1158 (March 2008).
   https://global.oup.com/academic/product/instabilities-and-self-organization-in-materials-9780199

3.2 EDITED BOOKS

1. N.M. Ghoniem, co-editor, "Patterns, Defects and Materials Instabilities,"Kluwer Academic Publishers, The Netherlands, 1990, 393 pages.
2. N.M. Ghoniem, Editor, "Plastic and Fracture Instabilities in Materials,"ASME Publications, AMD-**200**/ MD-**57**, 1996, 229 pages.

3. Akira Kobayashi and Nasr M. Ghoniem, co-editors, "Advances in Applied Plasma Science, Vol. I"Proc. of the 1^{st} Int. Symp. on Appl. Plasma Science, 22-26 Sept. 1997, UCLA, Los Angeles, CA., USA, 198 pages.

4. Bulatov, T. Diaz de la Rubia, R. Phillips, E. Kaxiras, and N. M. Ghoniem, Co-editors, "Multi-scale Modeling of Materials,"Proc. of the 1998 MRS Soc. Symp., **538**, 1999, 591 pages.

5. Akira Kobayashi and Nasr M. Ghoniem, Co-editors, "Advances in Applied Plasma Science, Vol. II"Proc. of the 2^{nd} Int. Symp. on Appl. Plasma Science, 20-24 Sept. 1999, Osaka Sun Palace, Osaka, Japan, 453 pages.

6. Nasr M. Ghoniem, Editor, Proc. of the 2^{nd} Int. Conf. on Multiscale Materials Modeling (MMM-2), Los Angeles, CA., October 2004, 484 pages

3.3 SPECIAL ISSUES OF JOURNALS

1. N.M. Ghoniem, R. Jones, E. Bloom, Eds, Fusion Materials and Design, special issue of *Nuclear Engineering and Design/Fusion*, **2**:1, 1984.

2. N.M. Ghoniem, H. Heinisch H. Huang, L. Kubin, Yu, and S. Yip, Guest Editors, Special Issue "Multiscale Materials Modeling,"*J. Comp.-Aided Mater. Design*, **6, No. 2&3** (1999) 374 pages.

3. N.M. Ghoniem and K.J. Cho, Guest Editors, Special Issue: "Mechanics of Materials from the nano- to the Meso-scale," *J. Comp. Meth. Engr. Science, CMES*, **3(2)** (2002)

4. Nasr M. Ghoniem, Hanchen Huang, and Esteban Busso, co-editors, "Special Issue on Multi-scale Modeling of Materials,"*Phil. Mag. A*, **83 (31-34)** (2003).

3.4 CHAPTERS & ARTICLES IN BOOKS

1. N.M. Ghoniem,"Pressure Vessel Technology,"G. Liu and R. Nichols, Pergamon Press, New York, 1989, Book Review in *Nuclear Technology*, 1990.

2. N.M. Ghoniem, R.J. Amodeo, "Computer Simulation of Dislocation Pattern Formation,"in *Non-Linear Phenomena in Materials Science-I*, L. Kubin and G. Martin, Eds., pp. 377-388.

3. N. M. Ghoniem and R. J. Amodeo, "Numerical Simulation of Dislocation Patterns During Plastic Deformation,"in *Patterns, Defects and Materials Instabilities*, D. Walgraef and N. M. Ghoniem, Eds., Applied Sciences, Series E, **183**, NATO ASI Series (Kluwer, The Netherlands, 1990) pp. 303-329.

4. R.J. Amodeo, N.M. Ghoniem, "Rapid Algorithms for Dislocation Dynamics in Micromechanical Calculations,"*Modeling of Deformation of Crystalline Solids*, T. Lowe, T. Rollett, P. Follansbee, and G. Daehn, Eds., TMS Press, 1991, pp. 125-143.

5. N.M. Ghoniem, "Non-Linear Dynamics of Shear Crack Interaction with Dislocations,"*Non-Linear Phenomena in Material Science II*, L. Kubin and G. Martin, Eds., Kluwer Academic Publishers, 1992.

6. Nasr M. Ghoniem, "Computational Methods for Mesoscopic, Inhomogeneous Plastic Deformation", *Proceedings of First Latin American Symposium on Materials Instabilities*, Valpareso, Chile, Kluwer Publication, 2000.

7. Nasr M. Ghoniem, "Radiation Damage Correlations for Fusion Conditions", *Encyclopedia of Materials: Science and Technology*, Pergamon Press, Elsevier Science Publication, 3413-3418 (2001), ISBN:0-08-0431526.

8. Nasr M. Ghoniem and Nick Kioussis, Hierarchial Models of Nanomechanics and Micromechanics," *Encyclopedia of Nanoscience and Nanotechnology*, American Scientific Publisher;,in Press, (2004).

9. Nasr M. Ghoniem, "Modeling the Dynamics of Dislocation Ensembles," *Handbook on Materials Modeling*, Kluwer-Springer,in Press (2004).

10. Nasr M. Ghoniem, "A Perspective on Dislocation Dynamics," in Handbook of Materials Modeling, S. Yip, Editor, Published by Kluwer-Springer, the Netherlands, Volume 2, 2871-2877 (2005).

11. Nasr M. Ghoniem, "The Role of Theory and Modeling in the development of Materials for Fusion Energy," in Handbook of Materials Modeling, S. Yip, Editor, Published by Kluwer-Springer, the Netherlands, Volume 2, 2269-2286 (2005).

12. Nasr M Ghoniem, "Dislocation Dynamics Simulations of Defects in Irradiated Materials", in: Comprehensive Nuclear Materials, Rudy Konings (Ed.), The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK: Elsevier Ltd., 1-52 (2009).

3.5 PAPERS IN REFEREED JOURNALS

1. N. M. Ghoniem and G. L. Kulcinski, "A Rate Theory Approach to Time Dependent Microstructural Development During Irradiation,", *Radiat. Eff.*, **39**:47-56, 1978.

2. N. M. Ghoniem and G. L. Kulcinski, "Swelling of Metals During Pulsed Irradiation,"*J. Nucl. Mater.*, **69&70-1&2**:816-820, 1978.

3. J. M. Griesmeyer and Ghoniem, N. M. "The Response of Fission Gas Bubbles to the Dynamic Behavior of Point Defects,"*J. Nucl. Mater.*, **80**:88-101, 1979.

4. N. M. Ghoniem and G. L. Kulcinski,"The Effect of Damage Rate on Void Growth in Metals,"*J. Nucl. Mater.*, **82-2**:392-402, 1979.

5. N. M. Ghoniem and D. D. Cho,"The Simultaneous Clustering of Point Defects During Irradiation,"*Phys. status solidi (a)* **54**:171-178, 1979.

6. N. M. Ghoniem and G. L. Kulcinski,"The Use of the Fully Dynamic Rate Theory to Predict Void Growth in Metals,"*Radiat. Eff.*, **41**:81-89, 1979.

7. N. M. Ghoniem and G. L. Kulcinski,"The Effect of Pulsed Irradiation on the Swelling of 316 Stainless Steel in Fusion Reactors,"*Nucl. Eng. Des.*, **52-1**:111-125, 1979.

8. J. M. Griesmeyer, N. M. Ghoniem, and D. Okrent,"A Dynamic Intragranular Fission Gas Behavior Model,"*Nucl. Eng. Des.*, **55-1**:69-95, 1979.

9. N. M. Ghoniem and G. L. Kulcinski,"Void Growth Characteristics in Laser Fusion First Walls,"*J. Nucl. Mater.*, **85&86,IIA**:547-552, 1979.

10. N. M. Ghoniem,"The Early Stages of Void and Interstitial Loop Evolution in Pulsed Fusion Reactors,"*J. Nucl. Mater.*, **89-2&3**:359-371, 1980.

11. N. M. Ghoniem and S. Sharafat,"A Numerical Solution to the Fokker-Planck Equation Describing the Evolution of the Interstitial Loop Microstructure During Irradiation,"*J. Nucl. Mater.*, **92-1**:121-135, 1980.

12. H. Gurol and N. M. Ghoniem,"Irradiation Creep by the Climb-Controlled Glide Mechanism in Pulsed Fusion Reactors,"*Radiat. Eff.*, **52**:103-126, 1980.

13. H. Gurol, N. M. Ghoniem, and L. K. Mansur,"A Correction to Irradiation Creep by the Climb-Controlled Glide Mechanism in Pulsed Fusion Reactors,"*Radiat. Eff. Lett.*, **67(1-2)**:27-30, 1981.

14. N. M. Ghoniem and H. Gurol,"An Analytical Approach to Void Growth in Metals Under Intense Radiation Pulsing,"*Radiat. Eff.*, **55**:209-222, 1981.

15. H. Gurol, N. M. Ghoniem, and W. G. Wolfer,"The Role of Dispersed Barriers in the Pulsed Irradiation Creep of Magnetic Fusion Reactor Materials,"*J. Nucl. Mater.*, **99**:1-15, 1981.

16. M. E. Sawan, G. L. Kulcinski, and N. M. Ghoniem,"Production and Behavior of Point Defects in Pulsed Inertial Confinement Fusion Reactors,"*J. Nucl. Mater.*, **103-104**:109-113, 1981.

17. H. Gurol, N. M. Ghoniem, and W. G. Wolfer,"Enhancement of Irradiation Creep in Pulsed Fusion Reactors,"*J. Nucl. Mater.*, **103-104**:1251-1255, 1981.

18. J. Yaung and N. M. Ghoniem,"Modifications of the Fuel Rod Analysis Program FRAP-S3 to Account for the Effects of Fuel Initial Density,"*Nucl. Tech.*, *54-1*:87-91, 1981.

19. R. Schafer and N. M. Ghoniem,"The Interaction of Helium and Displacement Damage in Inertial Confinement Fusion Reactors,"*J. Nucl. Mater.*, **104**:1457-1461, 1982.

20. N. M. Ghoniem and M. L. Takata,"A Rate Theory of Swelling Induced by Helium and Displacement Damage in Fusion Reactor Structural Materials,"*J. Nucl. Mater.*, **105-2-3**:276-292, 1982.

21. N. M. Ghoniem and R. W. Conn,"Report on the Second American Nuclear Society Topical Meeting on Fusion Reactor Materials,"*Nucl. Fusion.*, **22**:977-984, 1982.

22. N. M. Ghoniem and G. L. Kulcinski,"A Critical Assessment of the Effects of Pulsed Irradiation on the Microstructure, Swelling, and Creep of Materials,"*Nucl. Technol./Fusion.*, **2-2**:165-198, 1982.

23. R. W. Conn, V. Dhir, N. M. Ghoniem, et al.,"Studies of the Physics and Engineering of Deuterium-Deuterium Barrier Tandem Mirror Reactors,"*Nucl. Technol./Fusion.*, **2-4**:563-589, 1982.

24. P. S. Chou and N. M. Ghoniem,"Precipitate Dissolution Due to High Energy Collision Cascades,"*J. Nucl. Mater.*, **117**:55-63, 1983.

25. N. M. Ghoniem, S. Sharafat, J. Williams, and L. K. Mansur,"The Theory of Helium Transport and Clustering in Materials Under Irradiation,"*J. Nucl. Mater.*, **117**:96-105, 1983.

26. N. M. Ghoniem and D. H. Berwald,"Analysis of Blanket-Structure Lifetime for the Tandem Mirror Hybrid Reactor (TMHR),"*Nucl. Technol./Fusion.*, **4(2,2)**:439-444, 1983.

27. N. M. Ghoniem, member TMHR design team (TRW, LLL, Westinghouse, General Atomic, ORNL, ETEC, UCLA)"Fusion Breeder Reactor Design Studies,"*Nucl. Technol./Fusion.*, **4(2,2)**:589-598, 1983.

28. R. W. Conn, N. M. Ghoniem, S. P. Grotz, F. Najmabadi, K. Taghavi, and M. Z. Youssef, "Influence of Startup, Shutdown and Staged Power Operation on Tandem Mirror Reactor Design,"*Nucl. Technol./Fusion.*, **4(2,2)**:615-622, 1983.

29. N. M. Ghoniem, K. Taghavi, J. Blanchard, and S. P. Grotz,"Limits on Transient Power Variations During Startup and Shutdown of Li-Pb Cooled TMR Blankets,"*Nucl. Technol./Fusion.*, **4(2,3)**:769-774, 1983.

30. N. M. Ghoniem, member MARS blanket design team (TRW, General Dynamics, ETEC, UCLA),"MARS High Temperature Blanket,"*Nucl. Technol./Fusion.*, **4**:1233-1238, 1983.

31. N. M. Ghoniem and R. W. Conn,"Assessment of Ferritic Steels for Steady-State Fusion Reactors,"*Fusion Reactor Design and Tech.*, II IAEA-TC-392/62 (International Atomic Energy Agency, Vienna, 1983) pp. 389-402.

32. R. J. Amodeo and N. M. Ghoniem,"Constitutive Design Equations for Thermal Creep Deformation of HT-9,"*J. Nucl. Mater.*, **122&123**:91-95, 1984.

33. J. P. Blanchard and N. M. Ghoniem,"The Influence of Irradiation and Thermal Creep on Stress Redistribution in Fusion Blankets,"*J. Nucl. Mater.*, **122&123**:101-105, 1984.

34. E. P. Simonen, N. M. Ghoniem, and N. H. Packan,"Pulsed Flux Effects on Radiation Damage,"*J. Nucl. Mater.*, **122&123**:391-401, 1984.

35. S. Sharafat and N. M. Ghoniem,"Stability of Helium-Vacancy Clusters During Irradiation,"*J. Nucl. Mater.*, **122&123**:531-536, 1984.

36. N. M. Ghoniem,"Helium Migration and Its Influence on Cavity Formation in Irradiated Materials,"*Res Mechanica*, **10**:287-294, 1984.

37. K. Taghavi and N. M. Ghoniem,"Transient Thermal-Hydraulics Considerations of Tandem Mirror Li-Pb Cooled Blankets During Start-Up/Shut-Down Operations,"*Nucl. Eng. Des./Fusion.*, **1,4**:369-374, 1984.

38. K. Taghavi and N. M. Ghoniem,"Primary Loop Conditioning and Design Constraints on Li-Pb Cooled Tandem Mirror Reactors During Start-Up/Shut-Down Operations,"*Nucl. Eng. Des./Fusion*, **1,4**:375-386, 1984.

39. P. S. Chou and N. M. Ghoniem,"An Approximate Analytical Calculation of Precipitate Dissolution Rate Using a Slowing Down-Diffusion Theory for Charged Particles,"*Nucl. Instr. and Meth.*, **B9**:209-217, 1985.

40. J. P. Blanchard and N. M. Ghoniem,"Inelastic Structural Analysis of the MARS Tandem Mirror Fusion Reactor,"*Nucl. Eng. Des./Fusion.*, **2**:19-27, 1985.

41. R. S. Amodeo and N. M. Ghoniem,"Development of Design Equations for Ferritic Alloys in Fusion Reactors,"*Nucl. Eng. Des./Fusion.*, **2**:97-110, 1985.

42. R. Bullough and N. M. Ghoniem,"The Effect of Void Surface Motion on the Void Sink Strength for Point Defects,"*J. Nucl. Mater.*, **127**:47-55, 1985.

43. N. M. Ghoniem, J. N. Alhajji, and D. Kalleta,"The Effect of Helium Clustering on Its Transport to Grain Boundaries,"*J. Nucl. Mater.*, **136**:192-206, 1985.

44. P. Chou and N. M. Ghoniem,"On the Stochastic Theory of Point Defect Diffusion During Irradiation: Cascade Size and Shape Effects,"*J. Nucl. Mater.*, **137**:63-72, 1985.

45. J. P. Blanchard and N. M. Ghoniem,"The Influence of Uncertainties in Material Properties, and the Effects of Dimensional Scaling on the Prediction of Fusion Structure Lifetimes,"*Nucl. Eng. Des./Fusion.*, **4**:67-74, 1986.

46. P. S. Chou and N. M. Ghoniem,"Collisional Aspects of Preferential Sputtering Using the Monte Carlo Method,"*J. Nucl. Mater.*, **141-143**:216-220, 1986.

47. R. Martin and N. M. Ghoniem,"Modeling of Tritium Transport in a Fusion Reactor Pin-Type Solid Breeder Blanket Using the DIFFUSE Code,"*J. Nucl. Mater.*, **141-143**:244-248, 1986.

48. J. N. Al-Hajji and N. M. Ghoniem,"Comprehensive Modeling of Creep Fracture by Grain Boundary Cavitation in Irradiated Structural Alloys,"*J. Nucl. Mater.*, **141-143**:536-539, 1986.

49. N. M. Ghoniem, M. A. Firestone, and R. W. Conn,"The Influence of Reactor Operations on the Design and Performance of Tokamaks with Solid Breeder Blankets." Invited Paper Presented at Seventh Top. Mtg. on Technology of Fusion Energy (Reno, NV, June 1986) *Fusion Technol.*, **10**:1133-1145, 1986.

50. G. E. Orient and N. M. Ghoniem,"A Model for the Mechanical Interaction Between Solid Breeder and Cladding Materials,"*Fusion Technol.*, **10**:1617-1622, 1986.

51. J. P. Blanchard and N. M. Ghoniem,"The Bowing of Solid Breeder Rods in a Pin-Type Fusion Reactor,"*Fusion Technol.*, **10**:1623-1627, 1986.

52. P. Levin and N. M. Ghoniem,"Neutronic Optimization of a LiAlO2 Solid Breeder Blanket,"*Fusion Technol.*, **10**:1634-1639, 1986.

53. J. P. Blanchard, N. M. Ghoniem, and S. P. Chou,"An Approximate Solution to the Scattering Integral for General Interatomic Potentials,"*J. Appl. Phys.*, **61**:3120-3123, 1987.

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55. P. Chou and N. M. Ghoniem,"Applications of the Monte Carlo Code TRIPOS to Surface and Bulk Ion Transport Problems,"*Nucl. Instr. Meth. Phys. Res.*, **B28**:175-184, 1987.

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61. R. J. Amodeo and N. M. Ghoniem,"A Review of Experimental Observations and Theoretical Models of Dislocation Cells and Subgrains,"*Res Mechanica*, **23**:137-160, 1988.

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64. N. M. Ghoniem and R. Amodeo,"Computer Simulation of Dislocation Pattern Formation,"*Solid State Phenomena*, **3&4**:377-388, 1988.

65. D. Walgraef and N. M. Ghoniem,"Spatial Instabilities and Dislocation Loop Ordering in Irradiated Materials,"*Phys. Rev.* **B39**:8867-8872, 1989.

66. S. P. Chou and N. M. Ghoniem,"On Precipitate Dissolution Using the Cascade Slowing-Down Theory,"*Nucl. Instr. Meth. Phys. Res.* **B42**:145-148, 1989.

67. N. M. Ghoniem,"Stochastic Theory of Diffusional Planar Atomic Clustering and Its Application to Dislocation Loops,"*Phys. Rev.* **B39**:11810-11819, 1989.

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80. C. A. Stone and N. M. Ghoniem,"The Effects of Cluster Size-Dependent Aggregation on Thin Film Formation,"*Vacuum*, **41**:1111-1113, 1990.

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82. N. M. Ghoniem,"Nucleation and Growth Theory of Cavity Evolution Under Conditions of Cascade Damage and High Helium Generation,"*J. Nucl. Mater.*, **174**:168-177, 1990

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91. N.M. Ghoniem,"High-Temperature Mechanical and Material Design for SiC Composites,"*J. Nucl.Mater.*, **191-194**:551-519, 1992.

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343. Q.B. Jang, R.H. Tuffias, LaFerla and N.M. Ghoniem, "Design,"Analysis and Fabrication of Oxide Coated Iridium/Rhenium Combustion Chambers, JANAF Propulsion Conference, Monterey, CA, 1993.

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350. N.M. Ghoniem, "Computational Methods for Mesoscopic, Inhomogeneous Plastic Deformation,"Proc. of 1st Latin American Summer School on Materials Instabilities, Valparaiso, Chile, Nov. 30- dec. 4, (1998). Kluwer Publishers.

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353. S.J. Zinkle and N.M. Ghoniem, "Operating Temperature Windows for Advanced Structural Alloys,"Proc. of the Fifth International Symp. On Fusion Nuclear Technology (ISFNT-5), September 1999, Rome, Italy.

354. L. J. Perkins, B. G. Logan, M.D. Rosen, M.D. Perry, T. Diaz de la Rubia, N.M. Ghoniem, T. Ditmire, P.T. Springer, and S.C. Wilks, "Laser-Driven Micro Neutron Sources for Fusion Materials Testing at High Flux and Fluence,"in Ninth Int. Conf. On Fusion Materials, (ICFRM-9), Colorado Springs, Co., Oct. 11-16, 1999.

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356. M.D. Demetriou, A.S. Lavine, and N.M. Ghoniem, "Modeling Heating of Composite Powder particles in Plasma Spray Processing,"in "Advances in Applied Plasma Science, Vol. II"Proceedings of the Second International Symposium on Applied Plasma Science, 20-24 September 1999, Osaka Sun Palace, Osaka, Japan, page 431-438.

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368. Qiyang Hu and N. M. Ghoniem and D. Walgraef, and Nasr M. Ghoniem, "Multiscale Modelling of Self-Organized Mono-layer Surface Atomic Clusters," Technical Proceedings of the 2005 NSTI Nanotechnology Conference and Trade Show, Volume 2, page 306-309, May 2005, Anaheim, California, U.S.A.

369. S. J. Noronha and N. M. Ghoniem, "Brittle-Ductile Transition and Scatter in Fracture Toughness of Ferritic Steels,"Proceedings of Science [SMPRI 2005] 013.

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372. Aaron Aoyama, Shahram Sharafat1, Neil Morely, Sergey Smolentsev, Brian Williams, and Nasr Ghoniem, "Design and Thermo-mechanical Behavior of Flow Channel Inserts for the US-ITER Dual Coolant TBM," Eighth International Symposium on Fusion Nuclear Technology (ISFNT-8).

373. Akiyuki Takahashi, and Nasr M. Ghoniem, "A New Computational Method for Studies of 3-D Dislocation-Precipitate Interactions in Reactor Steels," Proceedings of the International Workshop on Structural Materials for Innovative Nuclear Systems (SMINS) in co-operation with the International Atomic Energy Agency, Karlsruhe, Germany, June 2007.

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377. S. Sharafat, A. Aoyama, N. Morley, N. Ghoniem, J. Blanchard, and S. Malang, "Thermo-Mechanical Analysis of a W-Ta-ODS Divertor Transition Joint", Proceedings of the 36th International Conference on Plasma Science and 23rd Symposium on Fusion Engineering (SOFE), San Diego, California, (06/05/2009).

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379. Crosby, T., Ghoniem, N.M., and Po, G., "Temporal and Spatial Heterogeneities of Plastic Deformation at the Micro Scale", International Symposium on Plasticity and Its Current Applications, the Bahamas, (January 2014)

380. N. J. Burbery, R. Das, W.G. Ferguson, G. Po, and N. Ghoniem, "Establishing effective criteria to link atomic and macro-scale simulations of dislocation nucleation in FCC metals", Proceedings of the International Conference on Computational Methods, ICCM2015, G. R. Liu and Raj Das (Eds.), Auckland, New Zealand, 2:1 - 12 (2015) .

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4 TEACHING & MENTORING ACTIVITIES

4.1 COURSES TAUGHT OR DEVELOPED

1. 105A: Introduction to Engineering Thermodynamics
2. 156A: Advanced Strength of Materials
3. 162B: Mechanical Product Design
4. 157: Mechanical Engineering Laboratory
5. 135: Fundamentals of Nuclear Science and Engineering
6. 136C: Fundamentals of Nuclear Reactor Materials
7. 181A: Complex Analysis and Integral Transforms
8. 182A: Mathematics of Engineering
9. 236A: Nuclear Materials
10. 236B: Radiation Interaction with Materials
11. 237D: Fusion Engineering and Design
12. 258A: Nanomechanics and Micromechanics
13. 296A: Mechanical Design for Power Transmission
14. 296B: Mechanical Design for High Temperature
15. 297B: Thermochemical Processing of Materials

4.2 POST-DOCTORAL & VISITING SCHOLARS

1. Dr. Nikolai Makhlin (USSR), National Academy of Sciences, USSR, Visiting Scholar, 11/02/1980 - 11/05/1980
2. Dr. Yuriy Platov (USSR), National Academy of Sciences, USSR, Visiting Scholar, 11/02/1980 - 11/05/1980
3. Dr. Shan H. Chien (Taiwan), Assistant Research Engineer, 03/01/1981 - 05/31/1981
4. Dr. Kaveh Taghavi (U.S.A.), Assistant Research Engineer, 08/01/1982 - 05/31/1985

5. Mr. Steve Grotz (U.S.A.), Assistant Development Engineer, 07/01/1983 - 10/01/1989
6. Dr. Helmut Trinkaus (Germany), Senior Visiting Research Scientist, 07/23/1984 - 08/07/1984
7. Dr. Peretz Levin (Israel), Visiting Associate Research Scientist, 09/17/1984 - 10/31/1985
8. Dr. Shahram Sharafat (U.S.A.), Assistant Development Engineer II, 11/01/1985 - 10/01/1989
9. Dr. Mohammad Hasan (U.S.A.), Postgraduate Research Engineer IV, 01/01/1986 - 10/01/1989
10. Dr. Ali Dabiri (U.S.A.), Visiting Research Scientist, 01/01/1986 - 09/01/1986
11. Mr. Patrick Cooke (United Kingdom, Culham Lab), Assistant Development Engineer II, 04/01/1986 - 11/30/1987
12. Dr. Philip Chou (U.S.A.), Assistant Development Engineer I, 08/01/1986 - 08/01/1989
13. Dr. Daniel Walgraef (Belgium), Research Professor, Free Univ. of Brussels, Belgium (Corr. member/Eurp. Acad of Sci, 04/01/1988 - Present
14. Dr. Walter Maurer (Germany), Visiting Research Scientist, KfK, West Germany, 07/01/1988 - 10/01/1988
15. Dr. Isabel Abril (Spain), Visiting Research Scientist, Physics Department, University of Madrid, Spain, 07/15/1988 - 10/15/1988
16. Dr. Christian Abromeit (Germany), Visiting Research Scientist, Hahn-Meitner Institute, Berlin, Fed. Rep. of Germany, 08/13/1989 - 10/30/1989
17. Dr. Martin Vicanek (Germany), NATO Post-doctoral Scholar, Physics Department, University of Braunshweig, 09/05/1989 - 08/30/1990
18. Dr. John Gittus (United Kingdom), Dir. of Communication and Infor., UK Atomic Energy Authority, UK. UCLA Regents Lect., 01/15/1990 - 02/15/1990
19. Professor Franscisco Trujillo (Spain), Professor, Dept. Mats. Sci. and Metallurgical Engr., Univ. Complutense de Madrid,Spn, 07/01/1991 - 06/31/1992
20. Professor Akira Kobayashi (Japan), Professor, Joining and Welding Research Institute, 10/01/1994 - Present
21. Professor Quanfang Chen (China), Professor, State Key Lab of Corrosion & Protection of Metals, Chinese Acad. of Sci, 10/01/1995 - 04/30/1996
22. Professor Hamed Sofrata (Saudi Arabia), Professor, Solar Program, King Abdu City for Science & Tech. (KACST), 10/01/1995 - 09/30/1996
23. Dr. Anter ElAzab, Post-Doctoral Fellow, 10/01/1996 - 09/30/1997
24. Dr. Shih-Hsi Tong, Post-doctoral Fellow, 07/01/1998 - 06/30/2002
25. Dr. Lizhi Sun, Post-Doctoral Fellow, 09/01/1998 - 08/30/1999
26. Dr. Marios Demitriou, Post-Doctoral Fellow, 05/01/2001 - 2005
27. Dr. Xueli Han, Associate Research Engineer, 05/01/2001 - 05/30/2004

28. Dr. Silvester Noronha, Post-Doctoral Fellow, 05/02/2002 - Present
29. Dr. Sauvik Banerjee, Post-Doctoral Fellow, 04/01/2004 - 2006
30. Dr. Jianming Huang, Post-Doctoral Fellow, 03/01/2004 - 07/31/2004
31. Dr. Zhiqiang Wang, Post-Doctoral Fellow, 10/01/2004 - 2006
32. Dr. Qiyang Hu, Post Doctoral Fellow, January 2005 - June 2009
33. Dr. Anthony Juan Brown, Post-Doctoral Fellow, April 2007 - May 2009
34. Dr. Ming Wen, Post-Doctoral Fellow, June 2006 - June 2008
35. Dr. Tamer Crosby, Post-Doctoral Fellow, May 2010 - 2014.
36. Dr. Giacomo Po, Post-Doctoral Fellow - Assistant Professor, May 2010 - present.
37. Dr. Zhengzheng Chen, Post-Doctoral Fellow, Sept 2011 - 2014.
38. Dr. Rani Harb, Post-doctoral Fellow, June 2011 - 2012.
39. Dr. Can Erel, Post-doctoral Fellow, June 2014 - 2016.
40. Dr. David Rivera, Post-doctoral Fellow, June 2015 - 2017.
41. Dr. Christopher Matthes, Post-doctoral Fellow, June 2015 - 2017.
42. Dr. Yinan Cui, Post-doctoral Fellow, 2015 - 2019.
43. Dr. Edward Gao, Post-doctoral Fellow, June 2018 -2019 .
44. Dr. Andrew Sheng, Post-doctoral Fellow, August 2018 - 2019.
45. Dr. Yue Huang, Post-doctoral Fellow, 2018 - 2020.
46. Dr. Burak Bal, Abdullah Gül University, Visiting Scholar, 01/2017-08/2017
47. Dr. Changmeng Liu, Beijing Institute of Technology, Visiting Scholar, 09/2017-03/2018
48. Dr. warren Nadvornick, Post-doctoral Fellow, 2021-2022.
49. Dr. Tarek Hatem, British University, Cairo, Egypt, Visiting Scholar, 2/1/2022-6/19/2022.

4.3 FORMER M.S. STUDENTS

1. CHO, DAVID DAIJOON: June 1979
2. SHARAFAT, SHAHRAM: June 1980
3. TAKATA, MYRA LEIGH : December 1980
4. AWADALLA, AWADALLA MESSIHA: March 1981
5. AL-HAJJI, JAMAL NASSER: June 1982
6. SCHAFER, ROBERT FRANCIS, JR: September 1982

7. AMODEO, ROBERT J : June 1983
8. BLANCHARD, JAMES PAGE: June 1984
9. NAUGHTON, TIMOTHY D : January 1986
10. JOHNSON, GREGORY A : December 1994
11. LEE, JEFF H TRW Engineer December 1994
12. KIM, ROBERT WOOSEOK: 1995
13. CHEN, ALAN X: February 1995
14. LEE, EYAN: February 1995
15. FADEN, SEAN ANDREW: September 1996
16. KLASS, ERIK HARPER: September 1996
17. SANDOVAL, HAROLD: September 1996
18. SUH, ELLIS MOONJUNE: September 1996
19. TOMSIO, NOAH: September 1996
20. YI, CHANG HYON: September 1996
21. ELIAS, ROMEO E : August 1997
22. HAMED, MOHAMAD F: December 1997
23. SHAABAN, MOHAMED: December 1997
24. CHEN, SHIOU-YU: March 1999
25. CAMARGO, CARLOS MIGUEL: July 1999
26. CHEN, YU-JU: May 2000
27. MARTINEZ, RUDOLPH DURAN, JR: September 2001
28. JOHNSON, DEVON KRYLE: September 2002
29. CHIU, JAMES JAU-KAI: March 2004
30. UNGUREANU, RAZVAN: October 2004
31. EDWARDS, BRUCE PHILIP: June 1992
32. DOAN, LONG CUU: June 1996
33. YU, ALLEN KAI-LANG: June 1996
34. LY, MINH IBM: December 1996
35. BACALONI, MARCO: December 1998

36. DANONT, DUKE V: January 1999
37. BOGER, CINDY FIETZE: June 2000
38. BOGER, DAVID HARRISON: June 2000
39. SAKOTA, ZELJKO GIGIO: December 2003
40. PATTAMANUCH, PATRICK CHALIT: June 2004

4.4 FORMER Ph.D. STUDENTS

1. AL-HAJJI, JAMAL NASSER: September 1985
2. SHARAFAT, SHAHRAM: March 1986
3. CHOU, SHANG-CHIH PHILIP: June 1986
4. AMODEO, ROBERT J : June 1988
5. BLANCHARD, JAMES PAGE: June 1988
6. ISSACCI, FARROKH: March 1990 (I. Catton, co-advisor)
7. MARTIN, RODGER CARL: March 1990
8. STONE, CHARLES ARNOLD, IV: December 1990
9. ORIENT, GEORGE EDGAR: March 1991
10. EL-AZAB, ANTER AHMED: November 1994
11. HUANG, HANCHEN: November 1994
12. LEHMER, RONALD DERRICK: June 1996 (R. Conn, co-advisor)
13. WON, JONGIK : June 1996 (R. Conn, co-advisor)
14. WELLS, BRIAN CURTIS: June 1997
15. BLUSH, LISA MARIE: November 2000 (R. Conn, co-advisor)
16. DEMETRIOU, MARIOS DEMETRI: September 2001 (A. Lavine, co-advisor)
17. JOHNSON, GREGORY A: March 2003
18. HUANG, JIANMING: April 2004
19. WANG, ZHIQIANG: September 2004
20. WEN, MING: October 2005
21. HU, QIYANG: December 2005
22. LIU, CHUNLEI : June 2006
23. LI, LAN : June 2006

24. ANDERSON, MIKE HUGH: June 2008
25. EL-AWADY, JAAFAR ABBAS: June 2008
26. RAMIREZ, BENJAMIN: May 2011.
27. CROSBY, TAMER: May 2011.
28. PO, GIACOMO: May 2011.
29. HARB, RANI: December 2011 (E. Tacirugulu, co-advisor).
30. MASSIMILLIANO REPUPILLI: June 2012 (E. Tacirugulu, co-advisor).
31. CAN, EREL: September 2013.
32. SEIF, DARIUSH: September 2013.
33. RIVERA, DAVID: June 2015.
34. MATTHES, CHRISTOPHER: June 2016.
35. GAO, EDWARD: March 2018.
36. SHENG, ANDREW: June 2018.
37. HUANG, YUE: August 2018.
38. ALABDULLAH, MOHAMED: 2020.
39. NADVORNICK, WARREN: 2021.
40. GHAZARI, ARIAN: March 2022.
41. DICKSTEIN, DYLLAN: May 2022.

4.5 Ph.D. & POST DOCTORAL STUDENTS CURRENTLY IN ACADEMIC POSITIONS

1. AL-HAJJI, JAMAL NASSER: Professor, Kuwait University Department of Mechanical Engineering.
2. SHARAFAT, SHAHRAM: Adjunct Professor, UCLA Department of Mechanical & Aerospace Engineering.
3. BLANCHARD, JAMES PAGE: Professor & Executive Associate Dean, University of Wisconsin-Madison.
4. CHARLES STONE: Lecturer, Department of Physics, Colorado School of Mines.
5. EL-AZAB, ANTER AHMED: Professor, Purdue University, Department of Nuclear Engineering.
6. HUANG, HANCHEN: Dean of the College of Engineering and the Lupe Murchison Foundation Chair at the University of North Texas.

7. WANG, ZHIQIANG: Assistant Professor, University of North Texas, Department of Mechanical Engineering.
8. ISABEL ABRIL SANCHEZ, Professor, University of Alicante (Spain) Department of Analytical chemistry.
9. FRANSCISCO JAVIER TRUJILLO: Professor, Universidad Complutense Madrid (Spain), Departamento de Física Teórica.
10. QUANFANG CHEN: Professor, University of Central Florida, Department of Mechanical, Materials & Aerospace Engineering.
11. LIZHI SUN: Professor, University of California, Irvine, Department of Mechanical Engineering.
12. SAUVIK BANERJEE: Associate Professor, Indian Institute of Technology Bombay (IITB), Department of Civil Engineering.
13. JAAFAR AL AWADY: Associate Professor, Department of Mechanical Engr., Johns Hopkins University.
14. AKIYUKI TAKAHASHI: Associate Professor, Science University of Tokyo.
15. MUTTASEM SHEHADEH: Assistant Professor, American University of Beirut.
16. GIACOMO PO: Assistant Professor, University of Miami, Department of Mechanical & Aerospace Engr., USA.
17. BURAK BAL, Abdullah Gül University, Assistant Professor.
18. CHANGMENG LIU, Beijing Institute of Technology, Assistant Professor.

5 COMMUNITY SERVICE ACTIVITIES

1. Co-organizer, "International Workshop on the Use of Super Computers in Radiation Effects Modeling", La Jolla, CA. January 1986
2. Member of Program Committee for the International Conference on Fusion Reactor Materials. October 1986 - October 1987
3. U.S. Representative on Materials Requirements for 14 MeV Neutron Testing,
4. U.S.-Japan Workshop on 14 MeV Neutron Testing, Osaka, Japan 1988
5. Member of Technical Program Committee for the Nineth Topical Meeting on Technology of Fusion Engineering, Chicago, IL. October 1989 - October 1990
6. Co-organizer, Workshop on the Development of SiC/SiC Composites for Fusion Reactors November 1991
7. Member, of the Japan-US Workshop on Radiation Effects on Materials, Nagoya, Japan June 1992

8. Member of "Think Tank Group" on ITER Structural Materials, Institute for Mechanics and Materials, UCSD April 1993

9. Member of Workshop on ITER Structural Materials, Institute for Mechanics and Materials, UCSD June 1993

10. Co-organizer of Office of Basic Energy Sciences/Office of Fusion Energy on "The Evaluation and Development of Interatomic Potentials for Large-Scale Simulation of Non-Equilibrium Phenomena in SiC", Santa Barbara, CA August 1993

11. Co-organizer of DOE Workshop on "Radiation Resistant Ceramic Matrix Composites", Rensselaer Polytechnique Institute July 1994

12. Member of US-Russia 1994 Exchange I.3 on "Structural Materials Development", Obninsk, Russia September 1994

13. Organizer: Sessions on "Plastic and Fracture Instabilities in Materials", ASME 1995 Summer Meeting, Los Angeles, CA June 1995

14. Member, Advisory Committee to the Chair of the Nuclear Engineering Department, UCB 1996 - Present

15. Co-organizer: Sessions on "Evolution of Micro-structure and Strain Localization", 1996 ASME Mechanics and Materials Conference, John Hopkins Univ., Baltimore, MD. June 1996

16. Co-Organizer, First International Symposium on Applied Plasma Science, UCLA, Los Angeles, CA. September 1997

17. Co-Organizer, International Symposium on "Multi-Scale Modeling of Materials", Materials Research Society (MRS) Fall Meeting, Boston November 1998

18. Co-Organizer, International Symposium on "Multi-Scale Modeling of Materials", International Union of Materials Research Societies (IUMRS), Beijing, China June 1999

19. Co-Organizer, Second International Symposium on Applied Plasma Science, Sun Palace, Osaka, Japan September 1999

20. Co-Organizer, Symposium on "Mechanics of Materials from Nano-to-Meso Scale", Anaheim, CA, August 2000. August 2000

21. Co-Organizer, MRS Symposium on the Limits of Strength in Theory and Practice, MRS Fall Meeting, Boston, USA, November 2000. November 2000

22. Co-Organizer, Third International Symposium and Applied Plasma Science, Fairbanks, Alaska July 2001

23. Co-Organizer, First International Conference on Multiscale Materials Modeling (MMM-1), London, United Kingdom June 2002

24. Co-Organizer, Symposium on Dislocation Mechanics, 7th US National Congress on Computational Mechanics (USNCCM), Albuquerque, NM June 2003

25. General Chair, Second International Conference on Multiscale Materials Modeling (MMM-2), Los Angeles, CA October 2004

26. Organizer, Computational Mechanics, The 2006 Seventh World Congress on Computational Mechanics 07/16/2006 - 07/22/2006

27. Symposium Organizer, USNCCM, USNCCM9: Minisymposium on Mathematical and Computational Aspects of Multi-scale and Multi-physics 07/23/2007 - 07/26/2007.

28. General Chair, the 19^{th} International Conference on Fusion Reactor Materials, La Jolla, CA., U.S.A., October 2019.

6 FELLOWSHIP AND RESEARCH GRANTS RECEIVED

Table 1: **FELLOWSHIP AND RESEARCH GRANTS RECEIVED**

Agency & Title	Duration of Grant	costs
"Microstructure Kinetics During Irradiation", NSF	04/01/1978 - 03/30/1980	$25,000
NSF, Eng 78-05413 "A Continuum Approach To The Dynamic Behavior of Gas Filled Cavities in Metals"	04/15/1978 - 03/31/1982	$49,699
Univ. of Wisconsin "The Behavior of Helium Bubbles Produced by Alpha-Particle Deposition"	01/01/1980 - 08/31/1981	$18,000
SANDIA Laboratories 28-0270 "Material Property Changes Caused by Pulsed Irradiation in a 'Single Pulse"	06/26/1980 - 06/30/1981	$35,622
DOE DE-AT03-80-ER52061 "Fusion Reactors: Physics & Technology" P.I. R. Conn, Co-PIs: Ghoniem, N.,Firestone, M.A.	10/01/1980 - 11/30/1985	$1,822,000
Oak Ridge Associated Universities "Magnetic Fusion Energy Technology Fellowship"	09/01/1981 - 08/31/1986	$24,000
DOE DE-AS08-71DP40158 "Mechanical Property Changes in the Single Pulse Test Facility" PI: Ghoniem, Co-PI:Conn, R.W.	09/03/1981 - 12/31/1982	$40,000
NSF, CPE 81-15571 "Microstructure Evolution in Irradiated Structural Materials"	02/01/1982 - 07/31/1984	$104,790
DOE DE-AT03-82ER52081 "Helium Effects on Swelling of Steels"	06/15/1982 - 12/31/1983	$80,000
DOE 52210 DE-FG03-84ER "Radiation Effects on Structural Materials"	01/01/1984 - 01/31/1990	$570,000
State of California/Micro (Without Overhead) 85-151 "Radiation Effects on Advanced Microelectronic Components"	07/01/1985 - 06/30/1986	$15,000
TRW/MICRO (Without Overhead) A57678AN5S "Radiation Effects on Advanced Microelectronic Components"	07/26/1985 - 06/30/1986	$16,291
DOE DE-FG03-86ER52126 "TITAN: A Reversed Field Pinch Fusion Reactor System Study" PI:Ghoniem, N., CO-PI: R.W.Conn	12/01/1985 - 11/30/1987	$925,000
State of California/Micro (Without Overhead) 86-101 "Radiation Effects on Advanced Microelectronic Components"	07/01/1986 - 06/30/1987	$15,000
TRW/MICRO (Without Overhead) AN2700AL6S "Radiation Effects on Advanced Microelectronic Components"	07/01/1986 - 06/30/1987	$16,291
State of California/Micro (Without Overhead) 86-101 "Radiation Effects on Advanced Microelectronic Components"	07/01/1987 - 06/30/1988	$14,220
TRW/MICRO (Without Overhead) DC3352A07S "Radiation Effects on Advanced Microelectronic Components"	07/01/1987 - 06/30/1988	$25,000
DOE DE-FG03-86ER52126 "Visions of The Future" A Program in Tokamak Reactor Studies" R.W. Conn (P.I.), N.M. Ghoniem, (CO-PI)	12/01/1987 - 11/30/1989	$1,045,000
State of California/Micro (Without Overhead) 88-150 "Charge Transport Model Using Finite Element/Particle Simulation"	07/01/1988 - 06/30/1990	$9,400
TRW/MICRO (Without Overhead) DW3975AF8S "Charge Transport Model Using Finite Element/Particle Simulation"	07/01/1988 - 06/30/1990	$25,000

Table 2: **FELLOWSHIP AND RESEARCH GRANTS RECEIVED, cont.**

Agency & Title	Duration of Grant	costs
NATO Travel Grant "Microstructure Stability During Irradiation"	07/01/1989 - 06/30/1993	$7,500
DOE/DT DE-FG03-91ER54115 "Radiation Effects And Micromechanics of SiC/SiC Composites"	12/01/1990 - 11/14/1996	$562,000
McDonnell Douglas Missile Systems Co. PO# YOER416R "Inertial Confinement Fusion Reactor Study"	01/01/1991 - 04/31/1992	$230,000
Institute of Plasma Physics & Fusion Research "Plasma Processing Equipment Phase I"	10/01/1995 - 07/01/1996	$60,000
Hughes Research Laboratory "Development of Ultra-Hard Coatings for Automotive Applications, Phase I"	04/01/1996 - 07/01/1999	$10,000
School of Engineering & Applied Science "Plasma Processing Equipment Phase II"	05/01/1996 - 06/30/1996	$40,000
REJEN, INC. "Fabrication, Testing & Post Examination of Silicon Carbide Foam Regenerators"	07/01/1996 - 12/31/1996	$25,000
ULTRAMET, INC. "Mechanical Fatigue of Ceramic Foams"	07/01/1996 - 06/30/1997	$35,000
REJEN, INC. "Heat Transfer And Thermal Fatigue Studies of Porous Ceramic Diesel Engine Regenerators"	08/01/1996 - 02/29/1997	$40,000
ULTRAMET/POWDERMET "Plasma Manufacturing of WC/Co Coatings with Sub-Micron Particles"	09/01/1996 - 08/30/1997	$33,557
ULTRAMET, INC. "Experimental Simulation of Thermo-Mechanical Fatigue in Diesel Engine Ceramic Regenerators"	10/01/1996 - 09/30/1997	$23,490
Hughes Research Laboratory (No Overhead) "Development of Ultra-Hard Coatings for Automotive Applications, Phase II"	10/01/1996 - 09/30/1999	$20,000
Lawrence Livermore National Lab (ASCI) "Dislocation Dynamics for Micro-Plasticity"	03/01/1997 - 02/28/2000	$119,166
Lawrence Livermore National Lab (Materials Institute) "Dislocation Models of Hardening"	07/01/1997 - 06/30/1999	$40,000
NSF/Institute of Mechanics & Materials (UCSD) (No Overhead) Graduate Student Fellowship	10/01/1997 - 09/30/1999	$22,000
POWDERMET INC. "Plasma-Assisted Manufacturing Using Hollow Micro-Spheres"	01/01/1998 - 04/30/2001	$29,938
U.S. DEPT. OF ENERGY DE-FG03-98ER54500 "Mechanisms of Plastic & Fracture Instabilities for Alloy Development of Fusion Materials"	07/15/1998 - 07/14/2003	$877,534
REJEN INC. "Cyclic Inertial Load Testing of SiC-Foam Disks for in-Cylinder Thermal Regenerators"	11/20/1998 - 06/30/1999	$10,000

Table 3: **FELLOWSHIP AND RESEARCH GRANTS RECEIVED, cont.**

Agency & Title	Duration of Grant	costs
U.S. Dept. of Commerce/National Institute of Standards ”Development of High-Density Plasma Spray Coatings Using Composite Powders”	12/03/1998 - 12/02/2001	$50,449
U.S. Dept. of Energy DE-FG03-00ER54594 ”Modeling Laser Effects on the Final Optics in Simulated IFE Environments”	08/15/2000 - 08/14/2003	$390,000
U.S. Dept. of Energy DE-FG03-01ER54626 ”in-Service Design & Performance Prediction of Advanced Fusion Material Systems by Computational Simulation”	03/01/2001 - 02/28/2004	$238,000
Commonwealth Technology P.O. #406371 Development of a Five-Year Research Plan for IFE Fusion Materials	05/01/2001 - 04/30/2002	$15,000
Oak Ridge National Laboratory (Operated By UT Battelle, LLC) -4000011196 ”Parallel Computing Cluster for Fusion Materials Science”	09/01/2001 - 08/31/2003	$87,102
National Science Foundation DMR-0113555 ITR/AP (MPS): Collaborative Research on Large-Scale Dislocation Dynamics Simulation for Computational Design of Semiconductor Thin Films	09/15/2001 - 09/14/2005	$327,895
Commonwealth Technology P.O. #406371 Development of a Five-Year Research Plan for IFE Fusion Materials	11/01/2001 - 11/01/2002	$15,000
U.S. Navy/Naval Research Laboratory N00173-02-1-G014 ”Fatigue Thermomechanics of Chamber Structures in High Average Power Laser Systems”	03/01/2002 - 05/28/2003	$140,000
Los Alamos National Laboratory (LANL) 54280-001-03 2F ”Development of Parallel, Experimentally Verifiable Computer Simulation Methodology For Studies of Micro-Scale Plasticity”	10/01/2002 - 09/30/2005	$205,000
Air Force Office Science Research (AFOSR) F49620-03-1-0031 ”Modeling the Deformation of Engineered Nano-Layered Structure by Computer Simulations”	01/01/2003 - 03/30/2006	$360,000
U.S. Navy/Naval Research Laboratory N00173-03-1-G904 ”Micro-Engineered Surfaces for High Average Power Laser (HAPL) Chambers”	03/22/2003 - 03/21/2006	$465,000
US/Department of Energy/ DE-FG02-03ER54708 ”Multiscale Modeling of Deformation, Fracture & Failure of Fusion Materials & Structures”	07/15/2003 - 11/14/2012	$2,427,000
US/Department of Energy DE-FG02-03ER54719 ”Development of Robust IFE Laser Mirrors & Multi-Scale Modeling of Pulsed Radiation Effects”	08/15/2003 - 08/14/2006	$256,000
USAF/ Office of Scientific Research FA9550-07-1-0396 Atomistic-Dislocation Dynamics Modeling of Fatigue Microstructure & Crack Initiation	06/01/2007 - 05/31/2010	$285,000

Table 4: **FELLOWSHIP AND RESEARCH GRANTS RECEIVED, cont.**

Agency & Title	Duration of Grant	costs
U.S. Navy/Office of Naval Research N00173-06-1-G905 Survival And Reliability Assessment of Chamber Structure Materials for High-Average Power Laser Systems (HAPL)	04/21/2006 - 10/30/2009	$371,000
US/DOE-Idaho Falls Operations Office DE-FC07-06ID14748 Multiscale Modeling of The Deformation of Advanced Ferritic Steels for Generation IV Nuclear Energy	03/13/2006 - 03/12/2009	$494,000
NATIONAL SCIENCE FOUNDATION CMS-0625299 Collaborative Research: Adaptive Hierarchical Multiscale Framework for Modeling the Deformation of Ultra-Strong Nano-Structured Materials	10/01/2006 - 09/30/2009	$198,756
NATIONAL SCIENCE FOUNDATION CMS-0506841 Nanostructured Materials for Interconnect & Packaging Technology (PI: K-N Tu, Co-PIs: N. Ghoniem, N. Kioussis, Y. Yang)	08/01/2005 - 07/31/2009	$1,275,000
NATIONAL SCIENCE FOUNDATION CMS-1024353 Loading Metal Nanostructures Under Extreme Conditions Using Stress Waves with Rarefaction Shock Profiles	09/01/2010 - 11/30/2013	$301,893
DEPARTMENT OF ENERGY DE-FG02-03ER54708:15 "Multiscale Modeling of Deformation, Fracture & Failure of Fusion Materials & Structures"	07/15/2003 - 11/14/2017	$5,176,977
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH Micro-Engineered Material Surfaces for Electric Propulsion and Pulsed Power	09/15/2011 - 9/14/2016	$2,500,000
SANDIA NATIONAL LABS Discrete Dislocation Dynamics Modeling of Tension-Torsion Loading	11/01/2014 - 12/31/2015	$75,000
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH Resilient Self-Healing Materials for the Extreme Environment of Space Electric Propulsion and Power	9/30/2016-9/29/2019	$1,200,000
US DEPARTMENT OF ENERGY Multiscale Modeling of Damage-Tolerant Fusion Reactor Materials	11/15/2017-11/14/2020	$1,500,000
US NATIONAL SCIENCE FOUNDATION- Co-PI Understanding and Controlling Atomic-Scale Mechanisms for Imparting Room Temperature Ductility in Tungsten	08/01/2017-07/31/2020	$463,191
US NATIONAL SCIENCE FOUNDATION - Co-PI Loading Metal Nanostructures Under Extreme Conditions Using Stress Waves with Rarefaction Shock Profiles	09/01/2017-08/31/2020	$301,893
DARPA - Co-PI Dual-effect thermionic and transpiration ultrahigh-flux cooling of leading edges	3/11/20 – 3/31/24	$2,731,625
ARPA-E - Co-PI Superalloy Heat exchangers Optimized for Temperature Extremes and Additive Manufacturability	9/30/19 – 9/29/22	$2,520,000

Table 5: **FELLOWSHIP AND RESEARCH GRANTS RECEIVED, cont.**

Agency & Title	Duration of Grant	costs
US Department of Energy Multiscale Modeling of the Mechanical Behavior of Damage-Tolerant Fusion Materials	11/15/20 – 8/14/23	$1,790,000