

## HONG WANG

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## WORKING AREAS

- Mechanical properties of materials at high levels of pressurization, temperature, irradiation, electric field, strain-rate loading
- Rock mechanics and rock engineering in reservoir, underground opening, excavation
- Piezoceramic device testing and characterization, and structural health monitoring
- ASME code case development for advanced alloys, BPVC Sections I & III
- Material removal mechanics in grinding and wear

## EDUCATION

Ph.D. in Mechanical Engineering-Engineering Mechanics, 08/2001, Michigan Technological University, Houghton, Michigan

D.E. & M.E. in Geotechnical Engineering, 11/1991, 06/1986, and B.E. in Hydraulic & Hydroelectric Engineering, 07/1983, Wuhan University of Hydraulic and Electric Engineering, Hubei, China

## WORKING EXPERIENCE

Oak Ridge National Laboratory, Mater. Sci. & Tech. Div., Oak Ridge, Tennessee,  
7/2016- present, R&D Staff; 4/2011- 6/2016, R&D Associate

### *Main ongoing projects*

1. DOE GTO Project: Foam Fracturing Study for EGS Stimulation, lead PI, FY19-20.
2. ORNL LDRD: Novel Environment for Contactless Creep Measurement at High Temperature, Co-PI, FY20-21. Task for data interpretation and analysis.
3. DOE NE UFDC Work Package, Co-PI, FY16-20. Main tasks for CIRFT testing of used fuels in hot-cell, measurement method evaluation and data analysis.
4. DOE FE ASME Code Cases for Alloys CF8C-Plus and Haynes 282, Co-PI, FY12-20. Main responsibilities: test planning, data analysis, data package, and presentations in ASME Code Week meetings.
5. DOE BTO Project: Pulsed Strengthened and Laser Edge Sealed VIG, Co-PI, FY19-21. Responsible for mechanical evaluation of VIG components and structures.

### *Main completed projects*

6. DOE NE ART Work Packages, AAD & AAT- ORNL, WPM, FY16-18; Task 1 Alloy 709 Code Case Testing, PI, FY16-19.
7. ORNL LDRD Project, SiC Sensor, Support, FY18-19. Responsible for piezo-resistive testing and evaluation.
8. NRC Project, Technical Gap Assessment for Materials and Component Integrity Issues for Molten Salt Reactors, FY17-18. Responsible for Subtask on high temperature mechanical properties.

9. NRC Project on SNF Vibration Integrity Study, Key Personnel, FY10-17. Main responsibilities included developing testing system for bending fatigue of spent nuclear fuel, addressing issues with hot-cell deployment, performing testing and characterization of high burn-up fuels.
10. ORNL Seed Money Project on SHM of Overhead Transmission Line Connectors, PI, FY15& 16.
11. DOE NEUP Project, UHP Concrete and Advanced Manufacturing Methods for Modular Construction, Co-PI, FY15. Main responsibilities included reviewing research reports, preparing proposals.
12. DOE EERE Project, Design Optimization of Piezoceramic MLAs for HDD Engine Fuel Injectors, Co-PI, FY06-15. Main responsibilities: developing experimental and analysis approaches, testing and characterization of piezoceramics and multilayer actuator, and preparing reports and papers.

*Other services*

13. MP&M Group Creep Lab, PI, FY12-18. Main responsibility included organizing weekly/ biweekly meeting to coordinate I&C needs.
14. Co-Advisor: Joseph P. Swindeman, Marion University (summer intern, 2016); Connor Way, University of Maryland (summer intern, 2015); James L. Wang, Vanderbilt University (summer intern, 2013); Kewei Zhang (post-doc, 2010-2011); Fan W. Zeng (post-bachelor, 2011-2012); Sung-Min Lee, Korean Inst. Ceram. Eng. and Tech. (visiting scientist, 2013-2014).

University of Tennessee, Dept. of MSE, Knoxville, Tennessee, 04/2008- 04/2011, Res. Assist. Prof.; Oak Ridge National Laboratory, Oak Ridge, Tennessee, 04/2004- 04/2008, Postdoc Res. Associate

Developed technical approach to studying piezoceramics and multilayer actuators in HDD engine fuel injection. Tested and characterized PZT materials, structural ceramics and intermetallic for engine components and systems.

The Johns Hopkins University, Dept. of Mech. Eng., Baltimore, Maryland, 11/2001-03/2004, Postdoc Res. Fellow

Performed mechanical testing and characterization of body armor ceramics under high strain-rate loading.

Michigan Technological University, Dept. of Mech. Eng.-Eng. Mech./ Min. Eng., Houghton, Michigan, 12/1996- 08/2001, Teaching / Res. Assistant

The University of Arizona, Dept. of Min. and Geol. Eng., Tucson, Arizona, 11/1995 - 11/1996, Visiting Scholar

Wuhan Univ. of Hydr. & Elec. Eng., Inst. Hydr. - Hydroelec. Sci., Wuhan, Hubei, China, 12/1992- 11/1996, Assoc. Prof.; 06/1986- 11/1992, Lecturer

**PUBLICATIONS** (32 journal papers, 50 conference papers/ book chapters, 5 U.S. patents, and 53 reports; more than 460 citations on google scholar)

### Journal Papers

1. X. Song, L. He, W. Yang, Z. Wang, Z. Chen, J. Guo, **H. Wang**, L. Chen, Additive manufacturing of bi-continuous piezocomposites with triply periodic phase interfaces for combined flexibility and piezoelectricity, *ASME J. of Manuf. Sci. and Eng.*, 2019, 141(11): 111004 (12 pages).
2. J.-A. Wang, **H. Wang**, H. Jiang, B. Bevard, High burn-up spent nuclear fuel transport reliability investigation, *Nucl. Eng. and Design*, 330, 2018, 497-515.
3. **H. Wang**, J.-A. J. Wang, Bending testing and characterization of surrogate nuclear fuel rods made of Zircaloy-4 cladding and aluminum oxide pellets, *J. of Nucl. Mater.*, 479, 2016, 470-482; doi: 10.1016/j.jnucmat.2016.07.044
4. H. Jiang, J.-A. J. Wang, and **H. Wang**, The impact of interface bonding efficiency on high-burnup spent nuclear fuel dynamic performance, *Nucl. Eng. and Design*, 309, 2016, 40-52.
5. J.-A. Wang, **H. Wang**, B. Bevard, and R. Howard, New rig for studying SNF vibration integrity, *Nucl. Eng. Int.*, 59 (725), 2014, 36-37.
6. J.-A. J. Wang, **H. Wang**, B. B. Bevard, R. L. Howard, and M. E. Flanagan, Reversible bending fatigue test system for investigating vibration integrity of spent nuclear fuel during transportation, *Packaging, Transport, Storage & Security of Radioactive Material*, 25, 2014, 119-132. Cited by 7.
7. **H. Wang**, J.-A. J. Wang, T. Tan, H. Jiang, T. S. Cox, R. L. Howard, B. B. Bevard, and M. E. Flanagan, Development of U-frame bending system for studying the vibration integrity of spent nuclear fuel, *J. of Nucl. Mater.*, 440, 2013, 201-213. Cited by 29.
8. **H. Wang**, S.-M. Lee, J. L. Wang, and H.-T. Lin, Fatigue of extracted lead zirconate titanate multilayer actuators under unipolar high field electric cycling, *J. Appl. Phys.*, 116, 2014, 234101. Cited by 4.
9. F. W. Zeng, **H. Wang**, and H.-T. Lin, Fatigue and failure responses of lead zirconate titanate multilayer actuator under unipolar high-field electric cycling, *J. of Appl. Phys.*, 114, 2013, 024101. Cited by 8.
10. K. Zhang, F. W. Zeng, **H. Wang**, H.-T. Lin, Biaxial flexural strength of poled lead zirconate titanate in high electric field with extended field range, *Ceramic International*, 39, 2013, 2023-2030.
11. K. Zhang, F. W. Zeng, **H. Wang**, and H.-T. Lin, Strength properties of aged poled lead zirconate titanate subjected to electromechanical loadings, *Smart Mater. Struct.*, 21, 2012, 117001 (7pp).
12. **H. Wang**, T. Matsunaga, H.-T. Lin, and A. M. Mottern, Piezoelectric and dielectric performance of poled lead zirconate titanate subjected to electric cyclic fatigue, *Smart Mater. Struct.*, 21, 2012, 025009 (13pp). Cited by 11.
13. **H. Wang**, T. A. Cooper, H.-T. Lin, and A. A. Wereszczak, Fatigue responses of lead zirconate titanate stacks under semi-bipolar electric cycling with mechanical preload, *J. Appl. Phys.*, 108 (8), 2010, 084107. Cited by 17.

14. **H. Wang**, H.-T. Lin, and A. A. Wereszczak, Strength properties of poled lead zirconate titanate subjected to biaxial flexural loading in high electric field, *J. Am. Ceram. Soc.*, 93 (9), 2010, 2843-2849. Cited by 9.
15. **H. Wang**, A. A. Wereszczak, and H.-T. Lin, Fatigue response of a PZT multilayer actuator under high-field electric cycling with mechanical preload, *J. Appl. Phys.*, 105 (1), 2009, 014112. Cited by 25.
16. **H. Wang**, and A. A. Wereszczak, Effects of electric field and biaxial flexure on the failure of poled lead zirconate titanate, *IEEE Trans. Ultras. Ferroelec. Freq. Contr.*, 55 (12), 2008, 2559-2570. Cited by 18.
17. F. Ren, J. J.-A. Wang, and **H. Wang**, Alternative approach for cavitation damage study utilizing repetitive laser pulses, *Wear*, 270 (1-2), 2010, 115-119. Cited by 2.
18. **H. Wang**, and K. T. Ramesh, Dynamic strength and fragmentation of hot-pressed silicon carbide under uniaxial compression, *Acta Mater.*, 52 (2), 2004, 355-367. Cited by 126.
19. **H. Wang** and G. Subhash, An approximate upper bound approach for single-grit rotating scratch with a conical tool on metals, *Wear*, 252 (11-12), 2002, 911-933. Cited by 20.
20. **H. Wang** and G. Subhash, Mechanics of mixed-mode ductile material removal with a conical tool and the size dependence of specific energy, *J. Mech. Phys. Solids*, 50 (6), 2002, 1269-1296. Cited by 20.
21. **H. Wang**, G. Subhash, and A. Chandra, Characteristics of single-grit rotating scratching with a conical tool on pure titanium, *Wear*, 249 (7), 2001, 566-581. Cited by 40.
22. P.H.S.W. Kulatilake, W. He, J. Um, and **H. Wang**, A physical model study of jointed rock mass strength under uniaxial compressive loading, *Int. J. Rock Mech. Min. Sci.*, 34 (3-4), 1997, Paper No. 165. Cited by 60.
23. Z. Zhang, **H. Wang**, and Z. Tao, Synopsis of research progress of rock creep properties, *J. Yangtze River Sci. Res. Inst.*, 13 (Suppl.), 1996, 1-5, ISSN 1001-5485. Cited by 15.
24. Q. Yu, Z. Tao and **H. Wang**, Rheological property of rock under the constant strain rate deformation and its experimental analysis, *J. Wuhan Univ. Hydr. Elec. Eng.*, 27 (Suppl.), 1994, 18-22, ISSN 1000-5153.
25. Z. Tao, **H. Wang** and Q. Yu, Experimental study on rheological properties of marble under step loading. *Sichuan Water Power*, (1), 1991, 23-29, ISSN 1001-2184. Cited by 6.
26. Z. Tao and **H. Wang**, Effect of size distribution of crack on the strength of rock, *J. Wuhan Univ. Hydr. Elec. Eng.*, 22 (2), 1989, 1-5, ISSN 1000-5153.
27. **H. Wang**, and Z. Tao, Statistical study on the failure of brittle rock under confining pressure, *Rock Mech.*, (19), 1989, 1-7.
28. Z. Tao and **H. Wang**, On the statistic theory of brittle fracture. *Frac. Strength of Rock and Concrete*, (1), 1986, 20-26.
29. Z. Tao and **H. Wang**, Simulation technology of joint network in rock mechanics, *J. Yangtze River Sci. Res. Inst.*, 7 (4), 1990, 18-26, ISSN 1001-5485. Cited by 3.
30. **H. Wang**, Z. Tao and Q. Yu, A preliminary study on the reliability analysis of rock slope with joint network, *J. Wuhan Univ. Hydr. Elec. Eng.*, 27 (Suppl.) 1994, 7-12, ISSN 1000-5153.

31. **H. Wang** and Z. Tao, The principle of joint network simulation for the stability analysis of rock slope and its engineering application, *J. Hydr. Eng.*, (10), 1993, 20-26, ISSN 0559-9350.
32. Z. Tao and **H. Wang**, Computer simulation test for rock slope stability analysis, *Site Investig. Sci. Tech.*, (6), 1990, 23-26, ISSN 1001-3946. Cited by 2.

### Papers in Conference Proceedings

33. **H. Wang**, J.-A. J. Wang, Y. Polsky, F. Ren, H. Li, V. Thakore, J. Xi, Study of foam fracturing for enhanced geothermal systems using model material, *Proc., 45<sup>th</sup> Workshop on Geothermal Reservoir Engineering*, Stanford University, Stanford, CA, Feb. 10-12, 2020, SGP-TR-216, 545-555.
34. V. Thakore, F. Ren, J. Voytek, J. Xi, **H. Wang**, J.-A. J. Wang, Y. Polsky, High-temperature stability of aqueous foams as potential waterless hydrofracking media for enhanced geothermal systems (EGS), *Proceedings, 45<sup>th</sup> Workshop on Geothermal Reservoir Eng.*, Stanford U., Stanford, CA, Feb. 10-12, 2020, SGP-TR-216, 535-544.
35. **H. Wang**, J.-A. J. Wang, Y. Polsky, F. Ren, Research considerations for foam fracturing in stimulation development for enhanced geothermal systems, *Proc. 44<sup>th</sup> Workshop on Geothermal Reservoir Eng.*, Stanford University, Stanford, CA, Feb. 11-13, 2019, SGP-TR-214, 617-627.
36. P. Joshi, T. Aytug, S. Mahurin, R. Mayes, S. Cetiner, **H. Wang**, I. Kravchenko, Y. Zhang, A. Ievlev, and R. Kisner, Piezoresistive and corrosion characteristics of silicon carbide for integrated sensor applications, *Proc. 11<sup>th</sup> NPIC & HMIT*, ANS Meetings, Orlando, FL, Feb. 9- 14, 2019, 1416-1424.
37. **H. Wang**, J.-A. J. Wang, J. P. Swindeman, F. Ren, J. Chan, Structural health monitoring of compression connectors for overhead transmission lines, *Proc. SPIE 10169*, Nondestr. Character. and Monit. of Adv. Mater., Aeros., and Civ. Infrastr. 2017, 101690M; doi: 10.1117/12.2261483 (12pp).
38. **H. Wang**, T. Matsunaga, K. Zhang, H.-T. Lin, and A. A. Wereszczak, Mechanical strength responses of poled lead zirconate titanate under extreme electric field and various temperature conditions, *Proc. ASME 2016 Int. Mech. Eng. Congress and Exposition*, Phoenix, AZ, Nov. 11-17, 2016, IMECE2016-67310.
39. **H. Wang**, S.-M. Lee, H.-T. Lin, and R. Stafford, Performance of PZT stacks under high-field electric cycling at various temperatures in heavy-duty diesel engine fuel injectors, *Proc. SPIE 9806*, Smart Mater. and Nondestr. Eval. for Energy Systems 2016, 98060Q; doi:10.1117/12.2219414 (11pp).
40. **H. Wang**, J.-A. J. Wang, F. Ren, J. Chan, Smart patch integration development of compression connector structural health monitoring in overhead transmission lines, *Proc. SPIE 9806*, Smart Mater. and Nondestr. Eval. for Energy Systems 2016, 980606; doi:10.1117/12.2218669 (11pp).
41. **H. Wang**, T. Matsunaga, and H.-T. Lin, Characterization of poled single-layer PZT for piezo stack in fuel injection system, *Proc. the 34<sup>th</sup> Int. Conf. on Adv. Ceramics and Composites*, Jan. 24-29, 2010, Daytona Beach, FL, also in Mechanical Properties and Performance of Engineering Ceramics and Composites V, *Ceram. Eng. Sci. Proc.*, 31 (2), 2010, 127-136. Cited by 2.
42. **H. Wang**, H.-T. Lin, T. A. Cooper, and A. A. Wereszczak, Mechanical strain and piezoelectric properties of PZT stacks related to semi-bipolar electric cyclic fatigue,

- Proc. the 33<sup>rd</sup> Int. Conf. on Adv. Ceramics and Composites*, Jan. 18-23, 2009, Daytona Beach, FL, also in *Advances in Electronic Ceramics II, Ceram. Eng. Sci. Proc.*, 30 (9), 2009, 53-63. Cited by 2.
43. **H. Wang**, and A. A. Wereszczak, Effects of electric field on the biaxial strength of poled PZT, *Proc. the 31<sup>st</sup> Int. Conf. on Adv. Ceramics and Composites*, Jan. 21-26, 2007, Daytona Beach, FL, also in *Advances in Electronic Ceramics, Ceram. Eng. Sci. Proc.*, 28 (8), 2007, 57-67. Cited by 5.
  44. **H. Wang**, J.-A. J. Wang, and H. Jiang, Fatigue behavior of spent nuclear fuel rods in simulated transportation environment. *Proc. ASME 2017 Pressure Vessels & Piping Conference*, PVP2017, Waikoloa, Hawaii, July 16-20, 2017, Paper Number: PVP2017-65842.
  45. J.-A. Wang, **H. Wang**, H. Jiang, B. Bevard, An innovative testing protocol to study spent nuclear fuel vibration integrity under normal condition of transportation, *Top Fuel 2015*, Zurich, Switzerland, Sept. 13-17, 2015.
  46. J.-A. Wang, **H. Wang**, H. Jiang, B. Bevard, R. Howard, and J. Scaglione, Lessons learned from CIRFT testing on SNF vibration integrity study, *Proc. 2015 International High-Level Radioactive Waste Management Conference*, Charleston, South Carolina, Apr. 12-16, 2015. IHLRWM 2015, pp. 515-522
  47. J.-A. Wang, **H. Wang**, H. Jiang, B. Bevard, R. Howard, and J. Scaglione, High burn-up spent nuclear fuel vibration integrity study-15134, *WM2015 Conference*, March 15-19, 2015, Phoenix, Arizona, USA.
  48. H. Jiang, J. J.-A. Wang, **H. Wang**, Potential impact of interfacial bonding efficiency on used nuclear fuel vibration integrity during normal transportation, *Proc. ASME 2014 Pressure Vessels & Piping Conference*, Anaheim, California, July 20-24, 2014. Paper No. PVP2014-29067, pp. V06AT06A021; 9 pages, doi:10.1115/PVP2014-29067
  49. H. Jiang, J. J.-A. Wang, **H. Wang**, Reversible bending fatigue testing system design concepts for spent fuel vibration integrity study, *Proc. ASME 2014 Pressure Vessels & Piping Conference*, Anaheim, California, July 20-24, 2014. Paper No. PVP2014-29117, pp. V06AT06A022; 7 pages, doi:10.1115/PVP2014-29117
  50. J.-A. Wang, **H. Wang**, B. Bevard, R. Howard, M. Flanagan and G. Bjorkman, Surrogate spent nuclear fuel vibration integrity investigation, *2014 American Nuclear Society Annual Meeting*, Reno, Nevada, June 15-19, 2014. Trans. the American Nuclear Society, Vol. 110, 2014, pp. 73-76.
  51. J.-A. Wang, H. Jiang, **H. Wang**, Potential effect of interfacial bonding on used nuclear fuel vibration reliability, *2014 American Nuclear Society Annual Meeting*, Reno, Nevada, June 15-19, 2014. Trans. the American Nuclear Society, Vol. 110, 2014, pp. 65-68.
  52. J.-A. Wang, **H. Wang**, B. Bevard, and R. Howard, Reversible bending fatigue testing on Zry-4 surrogate rods – 14503, *WM2014 Conference*, Phoenix, Arizona, USA, March 2-6, 2014.
  53. H. Jiang, J.-A. Wang, **H. Wang**, Potential impact of interfacial bonding efficiency on used nuclear fuel vibration integrity during normal transportation– 14502, *WM2014 Conference*, Phoenix, Arizona, USA, March 2-6, 2014.
  54. J.-A. J. Wang, **H. Wang**, B. B. Bevard, R. L. Howard, and M. E. Flanagan, Spent nuclear fuel test system for bending stiffness and vibration integrity, *Proc. 2013*

- International High-Level Radioactive Waste Management Conference*, ANS, Albuquerque, New Mexico, USA, Apr 28- May 2, 2013, Vol. 2, pp.1075-1082. Cited by 3.
55. P. F. Tortorelli, **H. Wang**, K. A. Unocic, M. L. Santella, J. P. Shingledecker, V. Cedro, III, Long-term creep-rupture behavior of Inconel® 740 and Haynes® 282, *Proc. ASME Symp. on Elev. Temp. Appl. of Mater. for Fossil, Nuclear, and Petrochem. Ind.*, Seattle, WA, March 25-27, 2014.
  56. P. F. Tortorelli, K. A. Unocic, **H. Wang**, M. L. Santella, and J. P. Shingledecker, Creep-rupture behavior of precipitation-strengthened Ni-based alloys under advanced ultrasupercritical steam conditions, *Adv. in Mater. Tech. for Fossil Power Plants*, Proc. the 7<sup>th</sup> Int. Conf., Waikoloa, Hawaii, USA, Oct 22-25, 2013, D. Gandy, J. Shingledecker Ed., EPRI, pp.131-142.
  57. **H. Wang**, A. A. Wereszczak, and M. J. Lance, Effect of grain size on dynamic scratch response in alumina, *Proc. the 30<sup>th</sup> Int. Conf. on Adv. Ceramics and Composites*, Jan. 22-27, 2006, Cocoa Beach, FL, also in *Ceram. Eng. Sci. Proc.*, 27 (2), 2006, 767-779. Cited by 3.
  58. **H. Wang**, H.-T. Lin, A. A. Wereszczak, N. Yang, and J. A. Jensen, Specific energy and scratch hardness of gamma titanium aluminides subjected to single-grit pendulum scratching, *Proc. ICEF2006*, ASME ICED 2006 Fall Technical Conference, Nov. 5-8, 2006, Sacramento, CA, No. 1532. Cited by 2.
  59. **H. Wang**, and A. A. Wereszczak, Mechanical responses of silicon nitrides under dynamic indentation, *Proc. the 29<sup>th</sup> Int. Conf. on Adv. Ceramics and Composites*, Jan 23–28, 2005, Cocoa Beach, FL, also in *Ceram. Eng. Sci. Proc.*, 26 (2), 2005, 275-283. Cited by 8.
  60. F. Ren, J.-A. Wang, Y. Liu, and **H. Wang**, Development of a pulsed pressure-based technique for cavitation damage study, *Proc. the 8<sup>th</sup> Int. Symposia on Cavitation*, Aug. 14-16, 2012, Singapore. Ed. C.-D. Ohl, E. Klaseboer, S. W. Ohl, S. W. Gong, and B. C. Khoo, 382-387.
  61. F. Ren, J.-A. Wang, and **H. Wang**, Cavitation damage study via a novel repetitive pressure pulse approach, *Proc. PVP2010*, 2010 ASME Pressure Vessels and Piping Conference, July 18-22, 2010, Bellevue, WA, USA, No. PVP2010-26102.
  62. Z. Tao, T. Chen, **H. Wang** and Q. Yu, Multiple roles of water in earthquake, *Proc. Int. Symp. on Reservoir-Induced Seismicity*, Beijing, China, Nov. 1-5, 1995, China Inst. of Water Resource & Hydropower Res. (Ed.).
  63. Z. Tao, T. Chen, **H. Wang** and Q. Yu, Dry earthquake - A kind of unusual reservoir-induced earthquake, *ibid.*
  64. Z. Tao and **H. Wang**, A study of the statistical theory for the failure of brittle rocks, *Scale Effect in Rock Mass*, Proc. the 1<sup>st</sup> Int. Workshop, Loen, Norway, June, 7-8, 1990, Cunha, A. P. D. (Ed.), Balkema, Rotterdam, 127-130, ISBN 90-6191-126-5.
  65. Z. Tao and **H. Wang**, The effect of size distribution of crack on the strength of rock, *Proc. Int. Symp. on Adv. in Geol. Eng.*, Beijing, China, Aug. 28-31, 1990, 128-132.
  66. Z. Tao and **H. Wang**, Study on the physical modeling of stochastically cracked rock in laboratory, *Proc. the 4<sup>th</sup> National Symp. on Rock, Concrete and Eng. Mater.*, Changsha, China, Oct. 1989, 346-354.
  67. **H. Wang**, and Z. Tao, Simulating technique of joint network and its application in the stability analysis of rock slope, *Proc. the 2<sup>nd</sup> Int. Conf. on Mech. of Jointed and*

- Faulted Rock*, Vienna, Austria 10-14 Apr. 1995, Rossmannith, H.-P. (Ed.), Balkema, Rotterdam, 627-632, ISBN 90-5410-541-0.
68. Z. Tao, Z. Zhang, and **H. Wang**, Measurement and analysis of convergence displacement in a circular tunnel, *EUROCK '92*, Proc. ISRM Symp. on Rock Characterization, Chester, UK, Sept. 14-17, 1992, Telford, T. (Ed.), London, 263-268.
  69. Z. Tao, Z. Zhang, and **H. Wang**, Convergence deformation measurement of the power tunnel, *Proc. the 5<sup>th</sup> Int. Conf. on Underground Space and Earth Sheltered Structures*, Delft, The Netherlands, 2-5 Aug. 1992, 212-216.
  70. **H. Wang**, Z. Tao and H. Zhu, Rock-mass joint network technique and its application in rock slope engineering, *Proc. the 4<sup>th</sup> Hubei and Wuhan Symp. on Rock Mech. and Eng.*, Wuhan, China, May 1992, 202-221.
  71. Z. Tao, Z. Zhang and **H. Wang**, Study on time-dependent convergence of underground opening, *Interaction between Geomater. & Hydr. Struct.*, Annual Meeting of National Natural Science Foundation of China (NNSFC), Beijing, China, Dec. 1991, April 1992, 30-38.
  72. Z. Tao, Z. Zhao, Q. Yu. and **H. Wang**, Study on the displacement back-analysis of underground power house in Dongfeng hydropower station, *ibid*, 39-48.
  73. **H. Wang** and Z. Tao, Computer simulation test for the reliability analysis of jointed rock slope, *Proc. the 4<sup>th</sup> National Symp. on Numer. Anal. Methods in Rock Soil Mech.*, Tai'an, China, Apr. 1991, Yan, J. (Ed.), Press of Wuhan Univ. Surv. Draw. Sci., 33-40, ISBN 7-81030-072-51/P.19
  74. Z. Tao, Q. Yu, Z. Zhang and **H. Wang**, On the deformation and failure of rock slope, *Proc. the 2<sup>nd</sup> Hubei and Wuhan Symp. on Rock Mech. and Eng.*, Yichang, China, Nov. 1990, 56-62.
  75. Z. Tao, Z. Zhang, Q. Yu and **H. Wang**, Preliminary study on stability of Marbukan rock slope, *ibid*, 70-75.
  76. Z. Tao and **H. Wang**, Study on the joint network simulation of high slope, *Proc. the 2<sup>nd</sup> National Symp. on Num. Cal. and Model Test in Rock Mech.*, Shanghai, China, Dec. 1990, Tongji Univ. Press, 67-74.
  77. Z. Tao and **H. Wang**, Prediction study on the rock mass geological condition of tunnel, *Proc. Symp. on New Analysis Approach of Rock and Soil Mech.*, Shanghai, China, Dec. 1989, Gao, D. (Ed.), Tongji Univ., Vol. 1, 71-78.
  78. Z. Tao and **H. Wang**, The effects of joint cohesion and water saturation on rock slope stability, *Proc. the 5<sup>th</sup> Int. Conf. on Appl. of Statis. and Prob. in Soil and Struc. Eng.*, Vancouver, Canada, May 25-29, 1987, Lind, N. C. (Ed.), Vol. 2, 791-796.

### Books/ Book Chapters

79. **H. Wang**, J.-A. J. Wang, Experimental Study on Surrogate Nuclear Fuel Rods Under Reversed Cyclic Bending, Fatigue and Fracture Test Planning, Test Data Acquisitions, and Analysis, ASTM STP 1598, Z. Wei, K. Nikbin, P. McKeighan, and G. Harlow, Eds., ASTM International, West Conshohocken, PA, 2017, pp. 19-36, <http://dx.doi.org/10.1520/STP159820160051>
80. **H. Wang**, Rock mechanics, in Solid Mechanics; Geotechnical engineering, in Hydraulic Engineering, Brief Chinese Scientific Encyclopedia, HuaXia Press, Beijing, 1998, ISBN 7-5080-1149-x



81. Z. Tao, Z. Zhao, Q. Yu, Z. Zhang, **H. Wang** and Y. Zeng, Properties of Fissured Rock Mass and Construction Mechanics of Tunnel System, China Geology University Press, 1993, ISBN 7-5625-0783-x/TV.3
82. Z. Tao, F. Tang, L. Zhang, **H. Wang** and T. Chen, Mechanics of Jointed and Faulted Rock, China Geology University Press, 1992, ISBN 7-5625-0658-2/P.235.

### Patents/ Invention Disclosures

83. **H. Wang**, J.-A. Wang, F. Ren, Systems, methods and patches for monitoring a structural health of a connector in overhead transmission lines, *U.S. Patent*, US 10,641,840 B2, May 5, 2020.
84. J.-A. J. Wang, **H. Wang**, F. Ren, T. S. Cox, Specimen for evaluating pressure pulse cavitation in rock formation, *U.S. Patent*, US 10,578,533 B2, Mar. 3, 2020.
85. J.-A. J. Wang, **H. Wang**, F. Ren, T. S. Cox, A Cavitation-based hydro-fracturing technique for geothermal reservoir stimulation, *U.S. Patent*, US 9,574,431 B2, Feb. 21, 2017.
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#### **CURRENT PROFESSIONAL AFFILIATION AND SERVICES**

- Member of American Society of Mechanical Engineers, SPIE-The International Society for Optical Engineering, American Ceramic Society, American Society for Metals.
- Chair, Session 5(B) EGS 1, Stanford Geothermal Workshop, Stanford, CA, Feb. 10-12, 2020
- Co-Chair, ASME Section III—Recent Developments, Elevated Temperature, ASME 2017 PVP Conference
- Session organizer, Multifunctional and Micro/Nano-Structured Materials, Mechanics of Solids, Structures and Fluids, ASME 2016 IMECE
- Manuscript review for Theoretical and Applied Fracture Mechanics, Nuclear Eng. & Design, Journal of Composite Materials, Materials Research Bulletin, Materials Science & Engineering, Mechanics of Materials, Acta Mechanica, Journal of the American Ceramic Society, and International Journal of Applied Ceramic Technology.