

# MATERIALS SCIENCE

GRADUATE DIRECTOR: DILIP GERSAPPE

DEPARTMENT CHAIR: MIKE DUDLEY

## ❖ Grants, Fellowships, and Awards

**Ba, Xiaolan.** (2010) Travel Award, \$100. *Sigma Xi*, Research Triangle Park, NC.

**Colmenares-Angulo, Jose.** (2009-2010) International Joint Graduate School Program, ¥583,000. *National Institute of Materials Science*, Tsukuba, Japan.

**Dorst, K.** (2010) Grants in Aid of Research Award, \$400. *Sigma Xi*, Research Triangle Park, NC.

**Dorst, K.,** Stein, A., Meng, Y. (2010) Poster Award, \$50. *National Synchrotron Light Source/Center for Functional Nanomaterials Joint Users' Meeting 2010*, Brookhven National Laboratory, Upton, NY.

**Dorst, K.** (2010) Travel Award, \$100. *Sigma Xi*, Research Triangle Park, NC.

**Gin, Peter.** (2010) East Asia and Pacific Summer Institutes Award, \$5,000. *National Science Foundation*, Washington, D.C.

**Gin, Peter.** (2010) JSPS Summer Fellowship, \$6,300. *The Japan Society for the Promotion of Science*, Tokyo, Japan.

**Gin, Peter.** (2009) Etter Student Lecturer Award, \$250. *American Crystallographic Association*, Toronto, ON.

**Gin, Peter.** (2009) Travel Award, \$500. *American Crystallographic Association*, Toronto, ON.

**Kerkar P.,** Horvat, K., Jones, K., Mahajan, D. (2009) First Place, Graduate Students Poster. *Advanced Energy Conference*, Hauppauge, NY.

Horvat, K., **Kerkar, P.,** Jones, K., Mahajan, D. (2009) Second Place, Undergraduate Student Poster presentation. *Advanced Energy Conference*, Hauppauge, NY.

**Liu, Ying.** (2009) Dr. Mow Shiah Lin Scholarship, \$1,000. *Brookhaven National Laboratory*, Upton, NY.

**Shank, Jason.** (2010) Life Member Award and Scholarship, \$500. *Stony Brook Alumni Association*, Stony Brook, NY.

**Shen, Zhao.** (2010) Certificate from the International Association for the Precious Metals Board of Directors honoring "outstanding work in precious metal research, as a student." *The International Precious Metals Institute*, Pensacola, FL.

**Wen, Jinsheng.** (2009) C. Margrett Student Lecturer Award. *American Crystallographic Association*, Toronto, ON.

**Wen, Jinsheng.** (2010) Sigma Xi Travel Award. *Sigma Xi*, Research Triangle Park, NC.

**Wen, Jinsheng.** (2010) Chinese Government Award for Outstanding Self-Financed Student Abroad. *China Scholarship Council*, Beijing, China.

## ❖ Jointly Authored Publications/Research Reports/Reviews

**Ba, Xiaolan,** Rafailovich, Miriam, Meng, Yizhi, Pernodet, Nadine, Wirick, Sue, Füredi-Mihofer, Helga, Qin, Yi-Xian and DiMasi, Elaine. (2010) Complementary effects of multi-protein components on biomineralization in vitro. *Journal of Structural Biology* 170(1): 83-92.

- Ba, Xiaolan**, DiMasi, Elaine and Rafailovich, Miriam. (2009) Study on effects of Type I collagen combined with noncollagenous proteins on hydroxyapatite formation in vitro using SPM and GIXD. *Materials Research Society Symposium Proceedings 2009*.
- Balazsi, C., **Bishop, A.**, Yang, J.H.C., Balazsi, K., Weber, F. and Gouma, P.I. (2009) Biopolymer-Hydroxyapatite Scaffolds for Advanced Prosthetics. *Composite Interfaces 16*(2-3): 191-200.
- Mušálek R., Kovářik O., Skiba T., Haušild P., Karlík M., **Colmenares-Angulo J.** (In Press) Fatigue Properties of FeAl Intermetallic Coatings Prepared by Plasma Spraying. *Intermetallics*.
- Colmenares-Angulo, J.**, Zhao, S., Young, C., Orlov A. (2009) The effects of thermal spray technique and post-deposition treatment on the photocatalytic activity of TiO<sub>2</sub> coatings. *Surface and Coatings Technology 204*(4): 423-427.
- Carvajal, J.J., Raghothamachar, B., Silvestre, O., **Chen, H.**, Pujol, M.C., Petrov, V., Dudley, M., Aguiló M., and Diaz, F. (2009) Effect of Structural Stress on the Laser Quality of Highly Doped Yb:KY(WO<sub>4</sub>)<sub>2</sub>/KY(WO<sub>4</sub>)<sub>2</sub> and Yb:KLu(WO<sub>4</sub>)<sub>2</sub>/KLu(WO<sub>4</sub>)<sub>2</sub> Epitaxial Structures. *Crystal Growth & Design 9*: 653-656.
- Chen, Y.**, Dudley, M., Sanchez E.K., and MacMillan, M.F. (2009) Sense Determination of Micropipes via Grazing-incidence Synchrotron White Beam X-ray Topography in 4H-Silicon Carbide. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 297-300.
- Chen, Y.**, Balaji, R., Dudley, M., Murthy, M., Freitas Jr., J.A., and Maximenko, S. (2009) Mapping of Defects in Large-Area Silicon Carbide Wafers via Photoluminescence and its Correlation with Synchrotron White Beam X-ray Topography. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 549-552.
- Chen, Y.**, Dudley, M., Liu, K.X., Caldwell, J. D., and Stahlbush, R.E. (2009) Synchrotron X-ray Topographic Studies of Recombination Activated Shockley Partial Dislocations in 4H-SiC Epitaxial Layers. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 357-360.
- MacMillan, M.F., Sanchez, E.K., Dudley, M., **Chen, Y.**, and Loboda, M. J. (2009) Micropipe Dissociation through Thick n+ Buffer Layer Growth. . In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 167-170.
- Dudley, M., **Chen, Y.**, and Huang, X.R. (2009) Aspects of Dislocation Behavior in SiC. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 261-266.
- Wu, P., Yoganathan, M., Zwieback, I., **Chen, Y.** and Dudley, M. (2009) Characterization of Dislocations and Micropipes in 4H n+ SiC Substrates. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 333-336.
- Kamata, I., Nagano, M., Tsuchida, H., **Chen, Y.** and Dudley, M. (2009) High Resolution Topography Analysis on Threading Edge Dislocations in 4H-SiC Epilayers. In S. Yoshida, S. Nishino, H. Harima, and T. Kimoto (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2007. Materials Science Forum 600-603*: 305-308.
- Kamata, I., Nagano, M., Tsuchida, H., **Chen, Y.** and Dudley, M. (2009) Investigation of Character and Spatial Distribution of Threading Edge Dislocations in 4H-SiC Epilayers by High-Resolution Topography. *J Cryst. Growth 311*: 1416-1422.
- Zhang, N., **Chen, Y.**, Zhang, Y., Dudley M., and Stahlbush, R.E. (2009) Nucleation Mechanism of Dislocation Half-Loop Arrays in 4H-Silicon Carbide Homo-Epitaxial Layers. *Appl. Phys. Lett. 94*: 122108.

- Wang, R., Ma R., and Dudley, M. (2009) Reduction of Chemical Reaction Mechanism for Halide Assisted Silicon Carbide Epitaxial Film Deposition. *Ind. Eng. Chem. Res.* 48: 3860-3866.
- Dudley, M., Zhang, N., and **Chen, Y.** (2009) Development of Methods for Dislocation Characterization in SiC Materials and Devices. In V. Raineri and F. Roccaforte (Eds.), *Proceedings of International Workshop on 3C-SiC Heteroepitaxy and Workshop on Advanced Semiconductor Materials and devices for Power Electronics Applications*. Catania, Italy: Consiglio Nazionale delle Ricerche Istituto per la Microelettronica e Microsistemi.
- Dwivedi, Gopal**, Wentz, Travis, Sampath, Sanjay, Nakamura, Toshio, (2009) Assessing Process and Coating Reliability Through Monitoring of Process and Design Relevant Coating Properties. *Journal of Thermal Spray Technology*. doi10.1007/s11666-009-9467-2
- Muller, E., Smedley, J., Raghothamachar, B., **Gaowei, M.**, Keister, J., Ben-Zvi, I., Dudley, M., Wu, Q. (In Press) Electronic Impact of Inclusions in Diamond. *2009 MRS Fall Meeting Symposium J Proceedings*.
- Ghabchi, Arash**, Khalil-Allafi, Jafar, Liu, Xuwen, Turunen, Erja, Söderberg, Outi, Varis, Tommi, Hannula S-P. (2009) Effect of Aging and Solution Annealing on Transformation and Deformation Mechanism of Super-elastic Ni50.9%-Ti Alloy in Nano-scale. *European Physical Journal B*.
- Ghabchi, Arash**, Varis, Tommi, Turunen, Erja, Suhonen, Tomi, Liu, Xuwen, Hannula, S-P. (2010) Behavior of HVOF WC-10Co4Cr Coatings with Different Carbide Size in Fine and coarse Particle Abrasion. *Special Issue of Journal of Thermal Spray Technology* 19(1-2): 368-377.
- Shakeri, M.S., Khalil-Allafi, J., Abbasi-Chianeh, V., **Ghabchi, Arash**. (2009) The Influence of Ni4Ti3 precipitates orientation on two-way shape memory effect in a Ni-rich NiTi alloy. *Journal of Alloys and Compounds* 485(1-2): 320-323.
- Haynes, A.** and Gouma, P. (2009) Polyaniline Based Environmental Gas Sensors. In Baraton, M.I. (Ed.), *Sensors for Environment, Health, and Security, NATO Science for Peace and Security Series*. Springer.
- Balazsi, C., Sedlackova, S., Pfeifer, J., Toth, A.L., Zayim, E.O., Szilagyi, L., **Kalyanasundaram, K.** and Gouma, P.I. (2009) Synthesis and Examination of Hexagonal Tungsten Oxide Nanocrystals for Electrochromic and Sensing Applications. In Baraton, M.I. (Ed.), *Sensors for Environment, Health, and Security, NATO Science for Peace and Security Series*. Springer.
- Kerker, P.**, Jones, K.W., Kleinberg, R.L., Lindquist, W.B., Tomov, S., Feng, H., Mahajan, D. (2009) Direct observations of three dimensional growth of hydrates hosted in porous media. *Applied Physics Letter* 95: 024102.
- Zheng, L., Zhang, H., Zhang, M., **Kerker, P.**, Mahajan, D. (2009) Modeling Methane Hydrate Formation in Marine Sediments. In T. Collett, A. Johnson, C. Knapp, and R. Boswell, (Eds.), *Natural gas hydrates—Energy resource potential and associated geologic hazards: AAPG Memoir* 89.
- Liu, Y.**, Rafailovich, M., Malal, D., Cohn, D., Chidambaram, D. (2009) Creation of novel bio-hybrid materials by encapsulation of microbes in polymer fibers via electrospinning process. *Proceedings of the National Academy of Sciences* 106(34): 14201-14206.
- Liu, Y.**, Li, C., Chen, S., Tadanori, K., Jonathan, S., Rafailovich, M. (2009) Electrospinning of poly(ethylene-co-vinyl acetate)/clay nanocomposite fibers. *Journal of Polymer Science Part B: Polymer Physics* 47: 2501-2508.
- Liu, Y.**, Franco, A., Huang, L., Gersappe, D., Clark, R., Rafailovich, M. (2009) Control of cell migration in two and three dimensions using substrate morphology. *Experimental Cell Research* 315(15): 2544-2557.
- Liu, Y.**, Ji, Y., Ghosh, K., Clark, R., Huang, L., Rafailovich, M. (2009) Effect of fiber orientation and diameter on the behavior of human dermal fibroblasts on electrospun PMMA scaffolds. *Journal of Biomedical Materials Research Part A* 90A: 1092-1106.

- Raghothamachar, B. **Sarkar, V.** Dudley, M. Noveski, V. and Sharan, S. (2009) A Novel X-ray Diffraction-based Technique for Complete Stress State Mapping of Packaged Silicon Dies. In P. A. Kohl, P. S. Ho, P. Thompson and R. Aschenbrenner (Eds), *Packaging, Chip-Package Interactions, and Solder Materials Challenges; Mater. Res. Soc. Symp. Proc. 1158E*. Warrendale, PA.
- Mironava, Tatsiana,** Hadjiargyrou, Michael, Simon, Marcia, Jurukovski, Vladimir & Rafailovich, Miriam H. (2010) Gold nanoparticles cellular toxicity and recovery: Effect of size, concentration and exposure time. *Nanotoxicology* 4(1): 120-137.
- Pack, Seongchan,** Kashiwagi, Takashi, Cao, Changhong, Korach, Chad, Lewin, Menachem, Rafailovich, Miriam. (2010) Role of Surface Interactions in the Synergizing Polymer/Clay Flame Retardant Properties. *Macromolecules*. doi10.1021/ma100669g.
- Pack, Seongchan,** Rafailovich, Miriam. (2010) Self extinguishing Polymer Clay Nanocomposite. Ch. 10 in Vikas Mittal (Ed.), *Thermally Stable and Flame Retardant Polymer Nanocomposites*. Cambridge, UK: Cambridge University Press.
- Gouma, P., Kalyanasundaram, K., Yun, X., Stanacevic M., and **Wang, L.** (2010) Chemical sensor and breath analyzer for ammonia detection in exhaled human breath. *IEEE Sensors, Special Issue on Breath Analysis* 10(1): 9-53.
- Szilagyi, I.M., **Wang, L.S.,** Gouma, P.I., Balazsi, C., Madarasz, J., and Pokol, G. (2009) Preparation of hexagonal WO<sub>3</sub> from hexagonal ammonium tungsten bronze for sensing NH<sub>3</sub>. *Materials Research Bulletin* 44(3): 505-508.
- Lee, S.H., Xu, G., Ku, W., **Wen, J.S.,** et al. (In Press) Coupling of spin and orbital excitations in an Fe-based superconductor. *Physical Review B*.
- Homes C.C., Akrap, A., **Wen, J.S.,** Xu Z.J., Lin, Z.W., Li, Q., and Gu, G.D. (2010) Electronic correlations and unusual superconducting response in the optical properties of the iron-chalcogenide FeTe<sub>0.55</sub>Se<sub>0.45</sub>. *Phys. Rev. B* 81: 180508(R).
- Wen, Jinsheng,** Xu, G., Gu, G., and Shapiro, S.M. (2010) Robust charge and magnetic order under electric field/current in a multiferroic LuFe<sub>2</sub>O<sub>4</sub>. *Phys. Rev. B* 81: 144121.
- Wen, Jinsheng,** Xu, G., Xu, Z., Lin, Z.W., Li, Q., Chen, Y., Chi, S., Gu, G. and Tranquada J.M. (2010) Effect of magnetic field on the spin resonance in FeTe<sub>0.5</sub>Se<sub>0.5</sub> as seen via inelastic neutron scattering. *Phys. Rev. B* 81: 100513(R).
- Parker, C.V., Pushp, A., Pasupathy, A.N., Gomes, K.K., **Wen, Jinsheng,** Xu, Z., Ono, S., Gu, G. and Yazdani, A. (2010) Nanoscale Proximity effect in the high-temperature superconductor Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+δ</sub> using a scanning tunneling microscope. *Phys. Rev. Lett.* 104: 117001.
- Palczewski, A.D., Kondo, T., **Wen, J.S.,** Xu, Z.J., Gu, G., and Kaminski, A. (2010) Controlling the carrier concentration of the high temperature superconductor Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+x</sub> in Angle Resolved Photoemission Spectroscopy (ARPES) experiments. *Phys. Rev. B* 81: 104521.
- Chatterjee, U., Shi, M., Ai, D., Zhao, J., Kanigel, A., Rosenkranz, S., Raffy, H., Li, Z.Z., Kadowaki, K., Hinks, D.G., Xu, Z.J., **Wen, J.S.,** Gu, G., Lin, C.T., Claus, H., et al. (2010) Observation of a d-wave nodal liquid in highly underdoped Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+δ</sub>. *Nature Phys.* 6: 99.
- Gann, R.D., Cao, J.X., Wu, R.Q., **Wen, Jinsheng,** Xu, Z., Gu, G.D. and Yarmoff, J. A. (2010) Adsorption of Iodine and Potassium on Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+δ</sub> investigated by low-energy alkali-ion scattering. *Phys. Rev. B* 81: 035418.
- Blanc, S., Gallais, Y., Sacuto, A., Cazayous, M., Measson, M.A., Gu, G., **Wen, J.S.** and Xu, Z.J. (2009) Quantitative Raman measurements of the evolution of the Cooper-pairs density with doping in Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+δ</sub> superconductors. *Phys. Rev. B* 80: 140502(R).
- Wen, Jinsheng,** Xu, Guangyong, Xu, Zhijun, Lin, Zhi Wei, Li, Qiang, Ratcliff, W., Gu, G. and Tranquada, J. M. (2009) Short-range incommensurate magnetic order near the superconducting phase boundary in Fe<sub>1+δ</sub>Te<sub>1-x</sub>Sex. *Phys. Rev. B* 80: 104506.

- Wen, Jinsheng**, Xu, G., Gu, G. and Shapiro, S. M. (2009) Magnetic-field control of charge structures in the magnetically disordered phase of multiferroic LuFe<sub>2</sub>O<sub>4</sub>. *Phys. Rev. B* 80: 020403(R).
- Pushp, A., Parker, C.V., Pasupathy, A.N., Gomes, K.K., Ono, S., **Wen, Jinsheng**, Xu, Z., Gu, G. and Yazdani, A. (2009) Extending Universal Nodal Excitations Optimizes Superconductivity in Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8+δ</sub>. *Science* 324: 1689.
- Wise, W.D., Chatterjee, K., Boyer, M.C. Kondo, T., Takeuchi, T., Ikuta, H., Zhijun, X., **Wen, Jinsheng**, Gu, G.D., Wang, Y. and Hudson, E.W. (2009) Imaging nanoscale Fermi surface variations in an inhomogeneous superconductor. *Nature Phys.* 5: 213.
- Gouma, P.I., Ramachandran, K., Firat, M., Connolly, M., Zuckermann, R., Balazsi, C., Perrotta, P.L. and **Xue, R.** (In Press) Novel Bioceramics for Bone Implants. *33rd ICACC Proceedings*.
- Balazsi, C., Bishop, A., **Yang, J.H.C.**, Balazsi, K., Weber, F. and Gouma, P.I. (2009) Biopolymer-Hydroxyapatite Scaffolds for Advanced Prosthetics. *Composite Interfaces* 16(2-3): 191-200.
- Colmenares-Angulo, J., Zhao, S., **Young, C.**, Orlov A. (2009) The effects of thermal spray technique and post-deposition treatment on the photocatalytic activity of TiO<sub>2</sub> coatings. *Surface and Coatings Technology* 204(4): 423-427.
- Zhang, Y., Chen, H., Zhang, N., Dudley, M., Gong, Y., Kuball, M., Xu, Z., **Zhang, Y.**, Edgar, J.H., Zhang, L. and Zhu, Y. (2009) Origins of Twinned Microstructures in B<sub>12</sub>As<sub>2</sub> Epilayers Grown on (0001) 6H-SiC and Their Influence on Physical Properties. In D.L. Perry, A. Burger, L. Franks, K. Yasuda, and M. Fiederle (Eds), *Nuclear Radiation Detection Materials-2009. Mater. Res. Soc. Symp. Proc. 1164*. Warrendale, PA.
- Zhang, Y., Chen, H., Dudley, M., **Zhang, Y.**, Edgar, J.H., Gong, Y., Bakalova, S., Kuball, M., Zhang, L., Su, D., Kisslinger, K., Zhu, Y. (In Press) Mechanism for Improved Quality B<sub>12</sub>As<sub>2</sub> Epitaxial Films on (0001) 4H-SiC Substrates by Tilting toward [1-100] Direction. *Mater. Res. Soc. Symp. Proc.*
- Dudley, M., Zhang, N., **Zhang, Y.**, Raghothamachar, B., Byrappa, S., Choi, G., Sanchez, E.K., Hansen, D., Drachev, R. and Loboda, M.J. (2010) Characterization of 100 mm Diameter 4H-Silicon Carbide Crystals With Extremely Low Basal Plane Dislocation Density. In A.J. Bauer, P. Friedrichs, M. Krieger, G. Pensl, R. Rupp and T. Seyller (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2009. Materials Science Forum* 645-648: 291-294.
- Dudley, M., Zhang, N., **Zhang, Y.**, Raghothamachar, B. and Sanchez, E.K. (2010) Nucleation of c-axis Screw Dislocations at Substrate Surface Damage During 4H-Silicon Carbide Homo-Epitaxy. In A.J. Bauer, P. Friedrichs, M. Krieger, G. Pensl, R. Rupp and T. Seyller (Eds.), *Silicon Carbide, III-Nitrides, and Related Materials 2009. Materials Science Forum* 645-648: 295-298.
- Bakalova, S., Gong, Y., Cobet, C., Esser, N., Zhang, Y., Edgar, J.H., **Zhang, Y.**, Dudley, M. and Kuball, M. (2010) Energy band structure and optical response function of icosahedral B<sub>12</sub>As<sub>2</sub>: A spectroscopic ellipsometry and first-principles calculational study. *Phys. Rev. B* 81: 075114.
- Gong, Y., Tapajna, M., Bakalova, S., Zhang, Y., Edgar, J.H., **Zhang, Y.**, Dudley, M., Hopkins, M. and Kuball, M. (In Press) Demonstration of Boron Arsenide Heterojunctions: A Radiation Hard Wide Bandgap Semiconductor Device. *App. Phys. Lett.*
- Zhang, Y.**, Chen, H., Choi, G., Raghothamachar, B., Dudley, M., Edgar, J.H., Grasza, K., Tymicki, E., Zhang, L., Su, D., Zhu, Y. (In Press) Nucleation Mechanism of 6H-SiC Polytype Inclusions Inside 15R-SiC Crystals. *J. Electron. Mater.*
- Colmenares-Angulo, J., **Zhao, S.**, Young, C., Orlov A. (2009) The effects of thermal spray technique and post-deposition treatment on the photocatalytic activity of TiO<sub>2</sub> coatings. *Surface and Coatings Technology* 204(4): 423-427.
- Si, W.D., Jie, Q., Wu, L.J., **Zhou, J.**, Gu, G.D., Johnson, P.D., Li, Q. (In Press) Superconductivity in Fe<sub>1.08</sub>Te:Ox Epitaxial Thin Films. *Physical Review B*.

- Solovyov, V.F., Bagarinao, K.D., Li, Q., Jie, Q., **Zhou, J.** (2010) Nature of Y1Ba2Cu3O7 Nucleation Centers on Ceria Buffers. *Superconductor Science and Technology* 23: 014008.
- Ke, X.Z., Chen, C.F., Yang, J.H., Wu, L.J., **Zhou, J.**, Li, Q., Zhu, Y.M., Kent, P.R. (2009) Microstructure and a Nucleation Mechanism for Nanoprecipitates in PbTe-AgSbTe2. *Physical Review Letters* 103: 145502.
- Si, W.D., Lin, Z.W., Jie, Q., Yin, W.G., **Zhou, J.** Gu, G.D., Johnson, P.D., Li, Q. (2009) Enhanced Superconducting Transition Temperature in FeSe0.5Te0.5 Thin Films. *Applied Physics Letters* 95: 052504.
- Wu, L.J., Zheng, J.C., **Zhou, J.**, Li, Q., Yang, J.H., Zhu, Y.M. (2009) Nanostructures and Defects in Thermoelectric AgPb18SbTe20 Investigated by Quantitative High Resolution Transmission Electron Microscopy. *Journal of Applied Physics* 105: 1.
- Li, Q., Lin, Z.W., **Zhou, J.** (2009) Thermoelectric Materials with Potential High Power Factors for Electricity Generation. *Journal of Electronic Materials* 38(7): 1268-1272.

❖ **Abstracts, Conferences/Colloquiums, Presentations, Symposiums, Workshops**

- Ba, Xiaolan**, Meng, Yizhi, DiMasi, Elaine and Rafailovich, Miriam. (2010) Effects of static magnetic fields on the biomineralization of osteoblast cultures. *Gordon Research Conference*. New London, NH. (poster)
- Ba, Xiaolan.** (2010) A novel method towards the bone regeneration engineering: static magnetic field effects on the biomineralization of osteoblast. *Joint NSLS and CFN Users' Meeting*. Brookhaven National Laboratory, Upton, NY.
- DiMasi, Elaine, **Ba, Xiaolan**, Meng, Yizhi, Wirick, Sue, Füredi-Mihofer, Helga and Rafailovich, Miriam. (2010) Complementary Effects of Multi-protein Components on Biomineralization in vitro. *Materials Research Society*. San Francisco, CA.
- Ba, Xiaolan**, DiMasi, Elaine and Rafailovich, Miriam. (2009) Study on the Effects of Type I Collagen Combined with Noncollagenous Proteins on Hydroxyapatite Formation *in vitro*. *Materials Research Society*. Boston, MA. (poster)
- Bejarano, M. Lorena.** (2010) Thermal Shakedown of Thermal Spray Coatings. *International Thermal Spray Conference (ITSC 2010)*. Singapore.
- Bhatnagar, Divya**, Cowman, Mary, Rafailovich, Miriam. (2009) Physically crosslinked Hyaluronic Acid based novel Hydrogels. *MRS Annual Fall Meeting*. Boston, MA.
- Bhatnagar, Divya**, Lombardi, Jack, Rafailovich, Miriam. (2009) Rheological Characterization of Polymer-clay Nanocomposite Hydrogels and the Effect of Glucose on Them. *MRS Annual Fall Meeting*. Boston, MA. (poster)
- Chang, Chungchueh.** (2009) The effects of TiO2 nanoparticles on dental pulp stem cell differentiation. *MRS*. Boston, MA.
- Chang, Chungchueh.** (2009) The effects of viscoelastic polymer substrates on dental pulp stem cell differentiation. *MRS*. Boston, MA.
- Chang, Chungchueh.** (2009) The effects of viscoelastic polymer substrates on adipose-derived adult stem cell differentiation. *MRS*. Boston, MA.
- Colmenares-Angulo, J.** (2010) Suspension/ Precursor Thermal Spray of TiO2: Process oriented exploratory studies. *Hybrid Materials Center*. National Institute of Materials Science of Japan, Tsukuba, Japan.
- Dorst, K.**, Meng, Y. (2009) Effect of Surface Topography and Chemistry on Osteoblast Biomineralization. *Materials Research Society Fall 2009 Meeting*. Boston, MA.

- Dorst, K., Meng, Y.** (2010) The Role of Chemical and Physical Modulation of Substrate Properties on Osteoblast Adhesion, Motility and Differentiation. *Gordon Research Conference on Biomaterialization*. New London, NH. (poster)
- Dorst, K., Meng, Y.** (2010). Adhesion, Migration and Differentiation Behavior of Osteoblasts on Various Surface Topographies. *2010 Joint NSLS and CFN Users' Meeting*. Upton, NY. (poster)
- Dwivedi, Gopal, Colmenares, Jose, Nakamura, Toshio, Sampath, Sanjay.** (2010) Effect of powder size distribution on the reproducibility of plasma spray process: A case study of plasma sprayed YSZ coatings. *International Thermal Spray Conference*. Singapore.
- Dwivedi, Gopal, Valarezo, Alfredo, Sampath, Sanjay, Nakamura, Toshio.** (2010) Changes observed in anelastic behavior of plasma sprayed YSZ coatings by modifying the defect surfaces. *International Thermal Spray Conference*. Singapore.
- Holmberg, Kenneth, Laukkanen, Anssi, Ronkainen, Helena, **Ghabchi, Arash, Helle, Aino, Rissa, Kati.** (2010) Coated Surface Wear Prediction by Computer Modelling. Plenary Talk by Holmberg, TriboBR. *1st Int. Brazilian Conf. on Tribology*. Rio de Janeiro, Brazil.
- Holmberg, Kenneth, Laukkanen, Anssi, **Ghabchi, Arash, Helle, Aino.** (2010) MicroFEM Modelling and Stress Simulation of Thick Composite Coating Structures. *Theoretical Modeling and Experimental Simulation in Tribology*. Cargese, France. (poster)
- Ghabchi, Arash, Helle, Aino, Holmberg, Kenneth.** (2010) Cracking Behavior of Thick Composite Coatings under Scratch Testing. *Nordtrib 2010*. Lulea, Sweden.
- Ghabchi, Arash, Holmberg, Kenneth, Valarezo, Alfredo, Turunen, Erja, Sampath, Sanjay.** (2010) Influence of Residual Stresses on Cracking Behavior of WC-17Co Coating in Scratch Test. *ITSC 2010*. Singapore.
- Ghabchi, Arash, Varis, Tommi, Turunen, Erja, Suhonen, Tomi, Hannula, S.P., Liu, Xuwen.** (2009) Behavior of HVOF WC-10Co4Cr Coatings with Different Carbide Size in Fine and Coarse Particle Abrasion. *International Thermal Spray Conference 2009*. Las Vegas, NV.
- Ghabchi, Arash, Khalil-Allafi, Jafar, Liu, Xuwen, Turunen, Erja, Söderberg, Outi, Varis, Tommi, Hannula, S.P.** (2009) Effect of Aging and Solution Annealing on Transformation and Deformation Mechanism of Super-elastic Ni50.9%-Ti Alloy in Nano-scale. *European Symposium on Martensitic Transformation (ESOMAT 2009)*. Prague, Czech Republic.
- Gin, Peter.** (2009) Summer School on Methods and Applications of Neutron Spectroscopy. *NIST Center for Neutron Research, National Institute of Standards and Technology*. Gaithersburg, MD.
- Gin, Peter, Asada, M., Sendogdular, L., Endoh, M.K., Yamaguchi, H., Kobayashi, M., Takahara, A., Koga T.** (2009) Anomalous Swelling of CO<sub>2</sub>-Philic Polymer Brushes in Density Fluctuating Supercritical Carbon Dioxide. *NSF/NCNR Summer School, NIST Center for Neutron Research, National Institute of Standards and Technology*. Gaithersburg, MD.
- Gin, Peter, Asada, M., Sendogdular, L., Endoh, M.K., Yamaguchi, H., Kobayashi, M., Takahara, A., Koga T.** (2009) Swollen Structures of Polymer Brushes in Density Fluctuating Supercritical Fluids. *American Crystallographic Association Annual Meeting*. Toronto, ON.
- Gin, Peter, Asada, M., Endoh, M.K., Satija, S.K. and Koga, T.** (2010) Green Manipulation of Cylinder Forming Block Copolymer Thin Films in Density Fluctuating Supercritical Carbon Dioxide. *American Physical Society March Meeting 2010*. Portland, OR.
- Lam, S., Asada, M., **Gin, Peter, Endoh, M.K. and Koga, T.** (2010) Manipulation of crystalline structures of ultrathin PEO films using supercritical CO<sub>2</sub>. *APS March Meeting*. Portland, OR.
- Asada, M., **Gin, Peter, Endoh, Maya K., Satija S.K. and Koga T.** (2010) Self-assembly of Nanoparticles at Polymer Surfaces Induced by Density Fluctuating Supercritical CO<sub>2</sub>. *APS March Meeting*. Portland, OR.

- Yamaguchi, H., Kobayashi, M., Morita, M., **Gin, Peter**, Koga, T., Satija, S.K., Takahara, A. (2009) Swollen Behavior of Fluoroalkylacrylate Brush Thin Films in Supercritical CO<sub>2</sub>. *The Japanese Society for Neutron Science Conference 2009*. Ibaraki, Japan.
- Asada, M., **Gin, Peter**, Endoh, M.K., Koga, T. (2009) Self-Organization of Nanoparticles at Polymer/Supercritical CO<sub>2</sub> Interface. *11<sup>th</sup> Polymer Material Forum*. The Society of Polymer Science, Tokyo, Japan. *International Conference on Neutron Scattering*. Knoxville, TN.
- Yamaguchi, H., Honda, K., Kobayashi, M., Morita, M., **Gin, Peter**, Koga, T., Bennett, S., Satija, S.K., Takahara A. (2009) Analysis of Molecular Aggregation States of Poly(perfluoroalkyl Acrylate) Brush Thin Films in Supercritical CO<sub>2</sub>. *The Symposium on Macromolecules*. The Society of Polymer Science, Tokyo, Japan.
- Koga, T., **Gin, Peter**, Asada, M., Endoh M. (2009) Universal Swelling of Polymer Thin Films in Density Fluctuating CO<sub>2</sub>. *Gordon Conference 2009: Liquids, Chemistry & Physics Of*. Holderness, NH.
- Yamaguchi, H., Honda, K., Kobayashi, M., Morita, M., **Gin, Peter**, Koga, T., Bennett, S., Satija, S.K., Takahara A. (2009) Analysis of Molecular Aggregation States of Poly(perfluoroalkyl Acrylate) Brush Thin Films in Supercritical CO<sub>2</sub>. *58th The Society of Polymer Science: Japan Annual Meeting*. Kobe, Japan.
- Asada, M., **Gin, Peter**, Endoh, M.K., Koga T. (2009) Surface Segregation of Nanoparticles in Polymer Thin Films Induced by Supercritical CO<sub>2</sub>. *NSLS/CFN Users' Meeting*. Upton, NY.
- Kerkar, P.**, Mahajan, D. (2010) In-situ Kinetics and X-ray Computed Microtomography Imaging Studies of Methane Hydrates in Host Sediments. *X-ray Science Division, Advanced Photon Source*. Argonne National Laboratory, Argonne, IL.
- Kerkar, P.**, Horvat, K., Jones, K., Mahajan, D. (2009) Understanding Laboratory-scale Methane Hydrate Dissociation in Porous Media: A Model for Marine Hydrate Occurrences. *Advanced Energy Conference*. Hauppauge, NY. (poster)
- Horvat, K., **Kerkar, P.**, Jones, K., Mahajan, D. (2009) Microscale Methane Hydrate Growth in Host Sediments. *Advanced Energy Conference*. Hauppauge, NY. (poster)
- Kerkar, P.**, Mahajan, D. (2009) In-situ Formation and Microscopic Characterization of Methane Hydrates in Host Sediments. *Atmospheric, Earth & Energy Division*. Lawrence Livermore National Laboratory, Livermore, CA. *Earth Sciences Division*. Lawrence Berkeley National Laboratory, Berkeley, CA.
- Lin, C.**, Simon, M., Jurukovski, V., Lee, W., Rafailovich, M. (2009) The Effect of Titanium Dioxide Nanoparticles on Keratinocyte Cell (KC) and Squamous Cell Carcinoma (SCC-13). *American Physical Society 2009 APS March Meeting*. Pittsburg, PA. *Materials Research Society 2009 MRS Fall Meeting*. Boston, MA.
- Liu, Ying**. (2009) In vitro migration of human dermal fibroblasts on the electrospun fibrous scaffold. *March American Physical Society Meeting*. Pittsburgh, PA.
- Liu, Ying**. (2009) Electrospinning of semicrystalline polymer fibers. *March American Physical Society Meeting*. Pittsburgh, PA.
- Liu, Ying**. (2009) Cell migration on the electrospun fibers. *Materials Research Society Fall Meeting*. Boston, MA.
- Mironava, T.**, Pernodet, N., Rafailovich M.H. (2009) Gold Nanoparticles effect on Human Dermal Fibroblast. *American Physical Society 2009 APS March Meeting*. Pittsburg, PA.
- Mironava, T.**, Rafailovich, M.H. (2010) Cell damage by energy saving light bulbs. *Nanotech Conference & Expo 2010*. Anaheim, CA.
- Mironava, T.**, Hadjiargyroy, M., Rafailovich, M.H. (2010) Gold nanoparticles cellular toxicity and recovery. *Nanotech Conference & Expo 2010*. Anaheim, CA.

- Pan, Cheng.** (2009) Nanoparticle Enhancement of Polymer Electrolyte Membrane Fuel Cell Power Output. *2009 Materials Research Society Fall Meeting*. Boston, MA. (poster)
- Ramakrsihnan, Girish,** Zhao, Shen and Orlov, Alexander. (2010) Simultaneous observation of gas phase and surface species in photocatalytic reactions: the next generation of FTIR applications. *American Chemistry Society*. Boston, MA.
- Zhao, Shen, **Ramakrsihnan, Girish,** Shen, Peichuan, Han, Weiqiang and Orlov, Alexander. (2010) Novel applications of sub-nanometer noble metal particles for photocatalysis. *American Chemistry Society*. Boston, MA.
- Zhao, Shen, **Ramakrsihnan, Girish,** Shen, Peichuan, Han, Weiqiang and Orlov, Alexander. (2010) Environmental photocatalysis: Exploring nanometer and sub-nanometer particles to enhance the activity. *American Chemistry Society*. Boston, MA.
- Sarkar, Vishwanath.** (2009) Residual stress mapping and depth profiling in packaged silicon integrated circuit using white beam synchrotron x-ray topography. *MRS Fall Meeting 2009*. Boston, MA.
- Zhao, Shen, Ramakrsihnan, Girish, **Shen, Peichuan,** Han, Weiqiang and Orlov, Alexander. (2010) Novel applications of sub-nanometer noble metal particles for photocatalysis. *American Chemistry Society*. Boston, MA.
- Zhao, Shen, Ramakrsihnan, Girish, **Shen, Peichuan,** Han, Weiqiang and Orlov, Alexander. (2010) Environmental photocatalysis: Exploring nanometer and sub-nanometer particles to enhance the activity. *American Chemistry Society*. Boston, MA.
- Wen, Jinsheng.** (2010) Effect of magnetic field on the spin resonance in  $\text{FeTe}_{0.5}\text{Se}_{0.5}$  as seen via inelastic neutron scattering. *9th International Conference on Spectroscopies in Novel Superconductors*. Shanghai, China. American Physical Society, Portland, OR, March 18, 2010.
- Wen, Jinsheng.** (2010) Neutron scattering studies on the interplay between magnetism and superconductivity in high- $T_c$  superconductors. *Provost Graduate Student Lecture Series*. Stony Brook University, Stony Brook, NY.
- Wen, Jinsheng.** (2009) Magnetic- and electric-field effects on the magnetic and charge order in a multiferroic  $\text{LuFe}_2\text{O}_4$ . *NIST Center for Neutron Research*. Gaithersburg, MD.
- Wen, Jinsheng.** (2009) Magnetic-field control of charge structures in a magnetically disordered phase of multiferroic  $\text{LuFe}_2\text{O}_4$ . *American Crystallographic Association*. Toronto, ON.
- Wen, Jinsheng.** (2009) Diffuse scattering and phonons from  $\text{K}_{0.98}\text{Li}_{0.02}\text{TaO}_3$ . National Synchrotron Light Source. *Brookhaven National Laboratory*. Upton, NY.
- Young, Christopher N.,** Clayton, Clive, Longtin, Jon, Granata, Richard. (2009/2010) Depth Profiling of Polymer Composites by Ultrafast Laser Ablation. *2009 ASME IMECE*. Lake Buena Vista, FL. *Naval Research Laboratory*. Washington, DC. (invited lecture)
- Young, Christopher N.,** Scott, William, Connelly, Guy, Clayton, Clive, Granata, Richard. (2009) Relating Matrix Chemistry and Laser Fluorescence in Thermally Damaged Polymer Composites. *2009 ASME IMECE*. Lake Buena Vista, FL.
- Zhang, Y.,** Chen, H., Choi, G., Raghathamachar, B., Dudley, M., Edgar, J.H., Graszka, K., Tymicki, E., Zhang, L., Su, D., Zhu Y. (2009) Nucleation Mechanism of 6H-SiC Polytype Inclusions Inside 15R-SiC Crystals. *ICMAT*. Singapore. *ACCGE, Symposium Industrial Crystal Growth*. Lake Geneva, WI. *DRIP*. Wheeling, WV.
- Bakaloval, S., Gong, Y., Cobet, C., Esser, N., Zhang, Y., Edgar, J.H., **Zhang, Y.,** Dudley, M. and Kuball, M. (2009) Band Gap and Optical Properties of Icosahedral  $\text{B}_{12}\text{As}_2$ : A New Material for Nuclear Applications. *MRS*. Boston, MA. (poster)
- Zhang, Y., Edgar, J.H., Gong, Y., Kuball, M., **Zhang, Y.,** Dudley, M., Kenik, E.A. and Meyer III, H. M. (2009) Heteroepitaxial  $\text{B}_{12}\text{As}_2$  on SiC Substrates. *MRS*. Boston, MA. (poster)

- Gong, Y., Tapajna, M., Zhang, Y., Edgar, J.H., **Zhang, Y.**, Dudley, M., Hopkins, M., Farlow, G. and Kuball, M. (2009) Boron Arsenide/Silicon Carbide Heterojunction Diodes: A Novel Radiation Resistant Device System. *MRS*. Boston, MA.
- Dudley, M., Byrappa, S., Wang, H., Wu, F., **Zhang, Y.**, Raghothamachar, B. and Choi, G. (2010) Analysis of Dislocation Behavior in Low Dislocation Density, PVT-Grown, Four-Inch Silicon Carbide Single Crystals. *MRS*. San Francisco, CA.
- Ramakrsihnan, Girish, **Zhao, Shen** and Orlov, Alexander. (2010) Simultaneous observation of gas phase and surface species in photocatalytic reactions: the next generation of FTIR applications. *American Chemistry Society*. Boston, MA.
- Zhao, Shen**, Ramakrsihnan, Girish, Shen, Peichuan, Han, Weiqiang and Orlov, Alexander. (2010) Environmental photocatalysis: Exploring nanometer and sub-nanometer particles to enhance the activity. *American Chemistry Society*. Boston, MA.
- Zhao, Shen**, Ramakrsihnan, Girish, Shen, Peichuan, Han, Weiqiang and Orlov, Alexander. (2010) Novel applications of sub-nanometer noble metal particles for photocatalysis. *American Chemistry Society*. Boston, MA.
- Zhou, J.**, Jie, Q., Wu, L.J., Li, Q. (2010) Microstructure Investigation of Filled Skutterudite Compound CeFe<sub>4</sub>Sb<sub>12</sub> by Melt Spinning and Spark Plasma Sintering. *MRS Spring Meeting*. San Francisco, CA.
- Jie, Q., **Zhou, J.**, Dimitrov, I., Camacho, J., Li, Q., Shi, X., Yang, J.H., Li, C.P., Uher, C. (2010) Thermoelectric Properties of the Non-Equilibrium Synthesized Filled Skutterudites. *MRS Spring Meeting*. San Francisco, CA.
- Dimitrov, Ivo, Manley, Michael, Jie, Qing, **Zhou, Juan**, Camacho, Jorge, Ehlers, Georg, Podlesnyak, Andrey, Shapiro, Steven, Li, Qiang. (2010) Phonon Density of States in Equilibrium and Non-equilibrium Prepared Ytterbium and Cerium-Filled Skutterudites. *APS March Meeting*. Portland, OR.
- Ke, X.Z., Chen, C.F., Yang, J.H., Wu, L.J., **Zhou, J.**, Li, Q., Zhu, Y.M., Kent, P.R. (2009) Microstructure and Nucleation Mechanism for Nanoprecipitates in PbTe-AgSbTe<sub>2</sub>. *APS March Meeting*. Pittsburgh, PA.
- Zhou, J.**, Jie, Q., Wu, L.J., Li, Q. (2010) Microstructure Investigation of Filled Skutterudite Compound CeFe<sub>4</sub>Sb<sub>12</sub> by Melt Spinning and Spark Plasma Sintering. *MRS Spring Meeting*. San Francisco, CA.
- Jie, Q., **Zhou, J.**, Dimitrov, I., Camacho, J., Li, Q., Shi, X., Yang, J.H., Li, C.P., Uher, C. (2010) Thermoelectric Properties of the Non-Equilibrium Synthesized Filled Skutterudites. *MRS Spring Meeting*. San Francisco, CA.
- Dimitrov, Ivo, Manley, Michael, Jie, Qing, **Zhou, Juan**, Camacho, Jorge, Ehlers, Georg, Podlesnyak, Andrey, Shapiro, Steven, Li, Qiang. (2010) Phonon Density of States in Equilibrium and Non-equilibrium Prepared Ytterbium and Cerium-Filled Skutterudites. *APS March Meeting*. Portland, OR.

❖ **Other**

- Bejarano, Miryan Lorena.** (2009-2010) Student Board Member. *ASM Thermal Spray Society*. Materials Park, OH.