

# Sisi Xiang

Materials Characterization Facility, Texas A&M University  
1617 Research Pkwy  
102 Giesecke Engineering Research Building, College Station, TX 77845  
Phone: 979.862.5959 Email: [sisixiang0@tamu.edu](mailto:sisixiang0@tamu.edu)

## EDUCATION

Ph.D.	Materials Science and Engineering	Beijing University of Technology	Jun. 2017
B.S.	Materials Science and Engineering	North University of China	Jun. 2009

## PROFESSIONAL EXPERIENCE

<b>Texas A&amp;M University</b> Assistant Research Scientist. Materials Characterization Facility	Oct. 2019 – Present
<b>Texas A&amp;M University</b> Postdoctoral research fellow. Department of Materials Science and Engineering	Feb. 2018 – Sept. 2019
<b>Texas A&amp;M University</b> Teaching Assistant (SEM/FIB). Department of Materials Science and Engineering	Sept. 2018 – Dec. 2018
<b>Beijing University of Technology</b> Research Assistant. Beijing Key Lab and Institute of Microstructure and Property of Advanced Materials	Jun. 2017 – Jan. 2018
<b>Zhejiang University</b> Joint Training Doctoral Student. State Key Laboratory of Silicon Materials and Department of Materials Science and Engineering	Jul. 2013 – Sept. 2013
<b>Chinese Academy of Sciences</b> Joint Training Doctoral Student. Superalloys Division, Institute of Metal Research	Mar. 2013 – Jun. 2013

## RESEARCH

- TEM characterization of helium precipitates in Ta-Ti (Zr) composites Sept. 2018 – Sept. 2019
- Quasi-plastic deformation mechanisms of boron carbide underneath Berkovich indent Mar. 2018 – Sept. 2019
- Atomic chemistry & structure characterization of carbides in a Ni-based superalloy Sept. 2012 – Jun. 2017
- Secondary  $\gamma'$  precipitation at high temperature creep in a Ni-based single crystal superalloy Sept. 2012 – Jun. 2017
- Deformation mechanisms of nanoscale single crystal metals Sept. 2011 – Jun. 2012

## TECHNICAL SKILLS

- 8-year experience of operating conventional TEM as well as SEM/FIB.
- 6-year experience of operating spherical-aberration corrected S/TEM (Cs-corrected S/TEM).
- Proficient in microscopy analysis techniques  
**SEM-based:** SE and BSE imaging, EDS, EBSD, and FIB.  
**TEM-based:** SAED, diffraction-contrast imaging (BF&DF), HRTEM and STEM (including HAADF), electron energy loss spectroscopy (EELS) and EDS, precession electron diffraction (PED) with NanoMEGAS ASTAR system.
- Proficient in in-situ TEM mechanical experiments and in-situ gas-solid experiments in environmental TEM.
- Proficient in FIB sample preparation and nano-fabrication, as well as conventional methods.

- Proficient in structure and image simulation software: Crystal Maker, QSTEM and Digital Micrograph.

## **ACHIEVEMENTS AND AWARDS**

- Best Conference Paper Award, The 2016 Chinese Conference on Microscopy (CEMS) 2016
- General Project of ‘Graduate of Science and Technology’ of BJUT 2012
- First Class Scholarship, North University of China 2009
- First Class Scholarship, North University of China 2008

## **PEER REVIEWED PUBLICATIONS**

1. **S.S. Xiang**, L.N. Ma, B. Yang, Y. Dieudonne, G.M. Pharr, J. Lu, D. Yadav, C. Hwang, J.C. LaSalvia, R.A. Haber, K.J. Hemker, K.Y. Xie. *Tuning the Deformation Mechanisms of Boron Carbide via Silicon Doping*, Science Advances, Accepted.
2. **S.S. Xiang**, L.N. Ma, B. Yang, C. Hwang, K.J. Hemker, R.A. Haber, K.Y. Xie. *Revealing the Microstructural Information of the Quasi-Plastic Zone in a Boron Carbide Using the Advanced Precession Electron Diffraction Technique*, Microscopy and Microanalysis 25 (S2), 788-789 (2019)
3. S. Qin, **S.S. Xiang**, B Eberle, K.Y. Xie, J.C. Grunlan, *High Moisture Barrier with Synergistic Combination of SiO<sub>x</sub> and Polyelectrolyte Nanolayers*, Advanced Materials Interfaces, 1900740 (2019).
4. C. Hwang, Q.R. Yang, **S.S. Xiang**, V. Domnich, A.U. Khan, K.Y. Xie, K.J. Hemker, R.A. Haber, *Fabrication of dense B<sub>4</sub>C-preceramic polymer derived SiC composite*, Journal of the European Ceramic Society, 39, 718-725 (2019).
5. M. Örneke, K. Wang, **S.S. Xiang**, C. Hwang, K.Y. Xie, R.A. Haber, *Molten salt synthesis of highly ordered and nanostructured hexagonal boron nitride*, Diamond and Related Materials, 93, 179-186 (2019).
6. R. Davidson, A. Verma, D. Santos, F. Hao, C. Fincher, **S.S. Xiang**, J.V. Buskirk, K.Y. Xie, M. Pharr, P.P. Mukherjee, S. Banerjee, *Formation of Magnesium Dendrites during Electrodeposition*, ACS Energy Letters, 4, 375–376 (2019).
7. M. Örneke, C. Hwang, **S.S. Xiang**, K.Y. Xie, A. Etzold, B. Yang, R.A. Haber, *Effect of synthesis conditions of BCNO on the formation and structural ordering of boron nitride at high temperatures*, Journal of Solid State Chemistry, 269, 212-219 (2019).
8. L.H. Wang, J. Teng, Y. Wu, X.C. Sha, **S.S. Xiang**, S.C. Mao, G.H. Yu, Z. Zhang, J. Zou, X.D. Han, *In situ atomic scale mechanisms of strain-induced twin boundary shear to high angle grain boundary in nanocrystalline Pt*, Ultramicroscopy, 195, 69-73 (2018).
9. **S.S. Xiang**, S.C. Mao, Z.J. Shen, H.B. Long, H. Wei, S.Y. Ma, J.X. Zhang, Y.H. Chen, J.F. Zhang, B. Zhang, Y.N. Liu, *Site Preference of Metallic Elements in M<sub>23</sub>C<sub>6</sub> Carbide in a Ni-Based Single Crystal Superalloy*, Materials and Design, 129, 9-14 (2017).
10. H.B. Long, S.C. Mao, **S.S. Xiang**, Y.H. Chen, H. Wei, Y.Z. Zhou, J.L. Liu, Y.N. Liu, *A modification on Brook formula in calculating the misfit of Ni-based superalloys*, Materials and Design, 126, 12-17 (2017).
11. **S.S. Xiang**, H.B. Long, S.C. Mao, H. Wei, Y.N. Liu, J.X. Zhang, Z.J. Shen, H.Y. Zhang, X.G. Wang, Z. Zhang, X.D. Han, *Response to “Comments on ‘Selective evolution of secondary γ’ precipitation in a Ni-based single crystal superalloy both in the γ matrix and at the dislocation nodes”*”, Scripta Materialia, 129, 104–106 (2017).
12. **S.S. Xiang**, S.C. Mao, H. Wei, Y.N. Liu, J.X. Zhang, Z.J. Shen, H.B. Long, H.Y. Zhang, X.G. Wang, Z. Zhang, X.D. Han, *Selective evolution of secondary γ’ precipitation in a Ni-based single crystal superalloy both in the γ matrix and at the dislocation nodes*, Acta Materialia, 116, 343-353 (2016).
13. H.B. Long, H. Wei, Y.N. Liu, S.C. Mao, J.X. Zhang, **S.S. Xiang**, Y.H. Chen, W.M. Gui, Q. Li, Z. Zhang, X.D. Han, *Effect of lattice misfit on the evolution of the dislocation structure in Ni-based single crystal superalloys during thermal exposure*, Acta Materialia, 120, 95-107 (2016).

14. Y. Lu, **S.S. Xiang**, L.R. Xiao, L.H. Wang, Q.S. Deng, Z. Zhang, X.D. Han, *Dislocation “Bubble-Like-Effect” and the Ambient Temperature Super-plastic Elongation of Body-centred Cubic Single Crystalline Molybdenum*, Scientific Reports, 6, 22937 (2016).
15. Q.Q. Ding, Z.J. Shen, **S.S. Xiang**, H. Tian, J.X. Li, Z. Zhang, *In-situ environmental TEM study of  $\gamma$ - $\gamma'$  phase transformation induced by oxidation in a nickel-based single crystal superalloy*, Journal of Alloys and Compounds, 651, 255–258 (2015).

## **CONFERENCE CONTRIBUTIONS**

1. **S.S. Xiang**, I. McCue, Y.Q. Wang, J.K. Baldwin, M. Demkowicz, K.Y. Xie, *Investigation of Helium Precipitates in Ta(Ti)/Zr(Ti) Composites Made by Solid Metal Dealloying*, 2019 TMS Annual Meeting & Exhibition, San Antonio, Texas, USA, March 2019. (Oral presentation)
2. **S.S. Xiang**, K.Y. Xie, K.J. Hemker, *Quasi-plastic Zone Characterization of Regular and Si-doped Boron Carbide*, 2019 TMS Annual Meeting & Exhibition, San Antonio, Texas, USA, March 2019. (Poster presentation)
3. K.Y. Xie, **S.S. Xiang**, H.M. Lien, B. Yang, R.A. Haber, *Characterization of Al-doped boron carbide*, The 43rd International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, FL, USA, 2019. (Oral presentation)
4. K.Y. Xie, **S.S. Xiang**, L.N. Ma, B. Yang, C. Hwang, R.A. Haber, K.J. Hemker, *Quasi-plastic zone characterization of regular and Si-doped boron carbide*, The 43rd International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, FL, USA, 2019. (Oral presentation)
5. **S.S. Xiang**, K.Y. Xie, K.J. Hemker, *Advanced Characterization of boron carbide*, Symposium on Small Scale Mechanical Behavior In honor of Dr. George M. Pharr IV. College Station, Texas, USA, Dec 2018. (Poster presentation)
6. **S.S. Xiang**, H. Wei, G.M. Han, H.B. Long, S.C. Mao, Y.N. Liu, Z. Zhang, X.D. Han, *Effects of secondary  $\gamma'$  precipitates during creep in a single crystal Ni-based superalloy*, The 2nd East-Asia Microscopy Conference, Himeji, Japan, 2015. (Poster presentation)
7. **S.S. Xiang**, H. Wei, G.M. Han, H.B. Long, S.C. Mao, Z. Zhang, X.D. Han, *Effects of secondary  $\gamma'$  precipitates during creep in a single crystal Ni-based superalloy*. Microscopy, 64(s1), i82 (2015).
8. H.B. Long, Q. Li, **S.S. Xiang**, S.C. Mao, H. Wei, Z. Zhang, X.D. Han, *Evolution of the MC carbide in Nickel-base single crystal superalloy exposing at 950°C*. Microscopy, 64(s1), i111 (2015).
9. **S.S. Xiang**, H. Wei, G.M. Han, S.C. Mao, Y.N. Liu, Z. Zhang, X.D. Han, *Effects of Re on the creep behavior of a second generation Ni-based single crystal superalloy*, The 1st East-Asia Microscopy Conference, Chongqing, China, 2013. (Poster presentation)

## **PATENT**

1. S.C. Mao, K.T. Zang, X.D. Wang, H.X. Li, S.D. Sun, **S.S. Xiang**, Z. Zhang, Chinese Patent, *One kind based on in situ transmission electron microscopy using uniaxial tensile deformation of the shape memory effect means*, Patent number: CN 201410109395.9.

## **MANUSCRIPTS IN REVIEW/UNDER PREPARATION**

1. **S.S. Xiang**, I. McCue, D. Yadav, Y.Q. Wang, J.K. Baldwin, M.J. Demkowicz, K.Y. Xie, *Comparative study of helium bubbles in a Ti-Ta alloy and a Ti-Ta nanocomposite*, Journal of Nuclear Materials, Submitted.
2. **S.S. Xiang**, H.M. Lien, B. Yang, K. Shial, R.A. Haber, K.Y. Xie, *The effect of boron and aluminum additions on the microstructure of arc-melted boron carbide*, Journal of the American Ceramic Society, To be submitted.