

CURRICULUM VITAE

Shirin Kaboli, PhD
Assistant Research Professor
Department of Geoscience
High Pressure Science and Engineering Center (HiPSEC)
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EDUCATION

Ph.D. in Materials Engineering (2015) McGill University
M.Sc. in Materials Science and Engineering (2010) McMaster University
B.Sc. in Metallurgy and Materials Engineering (2008) University of Tehran

RESEARCH INTERESTS

Scanning Electron Microscopy, In-Situ Synchrotron X-Ray Diffraction, Crystals Plasticity

PROFESSIONAL EXPERIENCE

Assistant Research Professor
Department of Geoscience
High Pressure Science and Engineering Center (HiPSEC)
University of Nevada, Las Vegas (UNLV)
(August 2016 - present)

Postdoctoral Research Scholar
Department of Geoscience
High Pressure Science and Engineering Center (HiPSEC)
University of Nevada, Las Vegas (UNLV)
(2015 - 2016)

PUBLICATIONS

1. S. Kaboli and P. Burnley, "On Stress Measurements in In-Situ Synchrotron Experiments of Forsterite Olivine", 20 Figures and 4 Tables, (in preparation).
2. S. Kaboli and R. Gauvin, "On Rotation Contour Contrast in Hot-Compressed Magnesium Alloys in a Scanning Electron Microscope", *Metallography, Microstructure, and Analysis*, 5(3), (2016), 188-195.
3. S. Kaboli and R. Gauvin, "Rotation Axes Analysis of Deformed Magnesium Based on Rotation Contour Contrast in a Scanning Electron Microscope", *Ultramicroscopy*, 154 (2015), 42–48.

4. S. Kaboli, H. Demers, N. Brodusch and R. Gauvin, "Rotation Contour Contrast Reconstruction using Electron Backscatter Diffraction in a Scanning Electron Microscope", *Applied Crystallography*, 48 (2015), 776-785.
5. S. Kaboli and J.R. Mcdermid, "Effect of Process Variables on the Grain Size and Crystallographic Texture of Hot-Dip Galvanized Coatings", *Metallurgical and Materials Transactions A.*, 45(9), (2014), 3938-3953.
6. S. Kaboli, D. Goldbaum, R.R. Chromik and R. Gauvin, "Microstructural Characterization of Mg-0.3Al-0.2Ca Alloy Using Ion Milling Surface Preparation Technique", *Metallography, Microstructure, and Analysis*, (2014), 1-6.
7. S. Kaboli, P.T. Pinard, J. Su, S. Yue and R. Gauvin, "Electron Channeling Contrast Observations in Deformed Mg Alloys Prepared with Ion Milling", *IOP Conference Series: Materials Science and Engineering*, 55(1), (2014), 012007.
8. S. Kaboli, D. Goldbaum, R.R. Chromik and R. Gauvin, "Electron Channeling Contrast Imaging of Plastic Deformation Induced by Indentation in Polycrystalline Nickel", *Microscopy and Microanalysis*, 19(6), (2013), 1620-1631.
9. J. Su, S. Kaboli, A.S.H. Kabir, I.H. Jung and S. Yue, "Effect of Dynamic Precipitation and Twinning on Dynamic Recrystallization of Micro-alloyed Mg-Al-Ca Alloys", *Materials Science and Engineering A.*, 587 (2013), 27–35.
10. J. Su, S. Kaboli, A.S.H. Kabir, I.H. Jung and S. Yue, "Dynamic Recrystallization and Texture of Micro-alloyed Magnesium-Aluminum-Calcium Alloys During Hot Deformation", *MS&T '13: Materials Science & Technology 2013 Conference Proceedings*, 3(2013), 1518-1527.
11. S. Kaboli and R. Gauvin, "Development of SEM-based Techniques to Characterize Hot-deformation Behavior of Magnesium Alloys", *Proceedings of the 9th International Conference on Magnesium Alloy and Their Applications*, July 8-12, 2012, Vancouver, BC, Canada, (2012).
12. J. Su, S. Kaboli, A.S.H. Kabir, P. Vo, I.H. Jung and S. Yue, "Precipitation Behavior of Micro Alloyed Mg-Al-Ca Alloys During Heat Treatment and Hot Compression", *Magnesium Technology*, (2012), 317-322.
13. M. Emy, A. Razaghian, S. Kaboli and J. Campbell, "Statistical Analysis of Tensile Properties of Cast A357/Al₂O₃ MMCs", *Materials Science and Technology*, 26(2), (2010), 149-156.
14. S. Kaboli and J.R. McDermid, Effect of Process Variables on the Solidification of Hot-dip Galvanized Coatings, *Steel Properties & Applications Conference Proceedings*, (2010), 679-689.

15. M. Emamy, R. Abbasi, S. Kaboli and J. Campbell, "Fluidity of Al Based Metal Matrix Composites Containing Al₂O₃ and SiC Particles", International Journal of Cast Metals Research, 22(6), (2009), 430-437.

AWARDS AND SCHOLARSHIPS

- 2015 1st Prize for Young Scientists' Contribution
European Microbeam Analysis Society (EMAS), 14th European Workshop on Modern Development and Applications in Microbeam Analysis
Portoroz, Slovenia
- 2015 European Microbeam Analysis Society Award
European Microbeam Analysis Society (EMAS), 14th European Workshop on Modern Development and Applications in Microbeam Analysis
Portoroz, Slovenia
- 2015 Gold Medal Award for Excellence in Contributions to Research
Mining and Materials Engineering, McGill University
- 2014 Early Career Scholar Award
6th Meeting of the International Union of Microbeam Analysis Societies, IUMAS-6
Hartford, CT
- 2014 Graduate Student Departmental Scholarship for Excellence in Contributions to Research
Mining and Materials Engineering, McGill University
- 2014 Annual Graduate Research Mobility Award
Mining and Materials Engineering, McGill University
- 2014 First Prize in Poster Competition in PhD Category
American Society of Metals (ASM) International, Montreal Chapter
McGill University
- 2013 Graduate Research Enhancement and Travel (GREAT) Award
Mining and Materials Engineering, McGill University
- 2013 Best Poster Presentation Award in Instrumentation, Microcopy and Microanalysis
Microscopy and Microanalysis (M&M) Annual Meeting
Indianapolis, IN
- 2013 1st Prize for Young Scientists' Contribution
European Microbeam Analysis Society (EMAS), 13th European Workshop on Modern Development and Applications in Microbeam Analysis
Porto, Portugal
- 2013 European Microbeam Analysis Society Award
European Microbeam Analysis Society (EMAS), 13th European Workshop on Modern Development and Applications in Microbeam Analysis

Porto, Portugal

- 2013 Annual Graduate Research Mobility Award
Mining and Materials Engineering, McGill University
- 2012 Graduate Research Enhancement and Travel (GREAT) Award
Mining and Materials Engineering, McGill University
- 2011-2013 McGill Engineering Doctoral Award (MEDA)
Mining and Materials Engineering, McGill University
- 2010 Best Oral Presentation in Materials Physics
22nd Canadian Materials Science Conference (CMSC)
University of Waterloo, Waterloo, ON
- 2010 Dante Cosma Graduate Scholarship
Materials Science and Engineering, McMaster University
- 2004 – 2008 Faculty Of Engineering (FOE) Annual Award
Faculty of Engineering, University of Tehran

TALKS AND POSTER PRESENTATIONS AT MEETINGS & COLLOQUIA

1. Poster presented on “Electron Channeling Contrast Imaging (ECCI) and Electron Backscatter Diffraction (EBSD) Study of Forsterite Olivine Deformed in the D-DIA Apparatus”, American Geophysical Union (AGU), San Francisco, CA, December 12-16, 2016.
2. (INVITED) Talk on “Deformation Analysis of Forsterite Olivine Using Electron Channeling Contrast Imaging and Electron Backscatter Diffraction”, Microscopy and Microanalysis (M&M) Annual Meeting, Columbus, OH, July 24-26, 2016.
3. Poster presented on “Deformation Analysis of Forsterite Olivine Using Electron Channeling Contrast Imaging (ECCI) and Electron Backscatter Diffraction (EBSD)”, Rock Deformation Gordon Research Conference (GRC), Andover, NH, August 21-26, 2016.
4. Poster presented on “In-Situ Synchrotron Experiments and Elastic Plastic Self-Consistent (EPSC) Modelling of Forsterite Olivine”, Stewardship Science Academic Programs (SSAP) Symposium, Bethesda, MD, February 17-18, 2016.
5. (INVITED) Talk on “Characterization of Hot-Compressed Magnesium Alloys in a Scanning Electron Microscope”, Microscopy and Microanalysis (M&M) Annual Meeting, Portland, OR, August 2-6, 2015.
6. Talk on “Electron Channeling Contrast Reconstruction with Electron Backscatter Diffraction”, European Microbeam Analysis Society (EMAS) Meeting, The Young Scientist Session, Portoroz, Slovenia, May 3-7, 2015.

7. Poster presented on “Electron Channeling Contrast Reconstruction with Electron Backscatter Diffraction”, European Microbeam Analysis Society (EMAS) Meeting, Portoroz, Slovenia, May 3-7, 2015.
8. Poster presented on “Rotation Contour Contrast (RCC) in Scanning Electron Microscope”, American Society of Metals (ASM) International, Montreal Chapter, Concordia University, 2015.
9. Poster presented on “Non-destructive Studies of Deformed Materials in Scanning Electron Microscope”, American Society of Metals (ASM) International, Montreal Chapter, McGill University, 2014.
10. Poster presented on “Plastic deformation studies with electron channeling contrast imaging and electron backscattered diffraction”, McGill Engineering Research Showcase, McGill University, October 2013.
11. Talk on “Microstructural Characterization of Mg-Al-Ca Alloys Using Ion Milling Surface Preparation Technique”, Microscopy and Microanalysis (M&M) Annual Meeting, Indianapolis, IN, August 4-8, 2013.
12. Poster presented on “Visualization and Quantification of Plastic Strain Induced by Indentation in Polycrystalline Nickel”, Microscopy and Microanalysis (M&M) Annual Meeting, Indianapolis, IN, August 4-8, 2013.
13. Poster presented on “Sputter-Induced Topography on Magnesium During Ion Beam Milling Surface Preparation”, Microscopy and Microanalysis (M&M) Annual Meeting, Indianapolis, IN, August 4-8, 2013.
14. Talk on “Plastic Deformation Studies with Electron Channeling Contrast Imaging and Electron Backscattered Diffraction”, European Microbeam Analysis Society (EMAS) Meeting, The Young Scientist Session, Porto, Portugal, May 12-16, 2013.
15. Poster presented on “Plastic Deformation Studies with Electron Channeling Contrast Imaging and Electron Backscattered Diffraction”, European Microbeam Analysis Society (EMAS) Meeting, Porto, Portugal, May 12-16, 2013.
16. Talk on “Characterization of Indentation Induced Plastic Deformation”, 25th Canadian Materials Science Conference (CMSC), McGill University, June 17-19, 2013.
17. Talk on “Microstructural Characterization of Compressed Mg-Al-Ca Alloys”, 25th Canadian Materials Science Conference (CMSC), McGill University, June 17-19, 2013.
18. Poster presented on “Imaging Plastic Deformation Induced by Nanoindentation in Polycrystalline Nickel”, American Society of Metals (ASM) International, Montreal Chapter, École Polytechnique de Montréal, February 2013.

19. Poster presented on “Comparison of Electron Channeling Contrast Imaging (ECCI) and Electron Back Scattered Diffraction (EBSD) using Hitachi SU8000 FE-SEM”, Microscopy and Microanalysis (M&M) Annual Meeting, Phenix, AZ, July 29-Aug 2, 2012.
20. Poster presented on “Development of SEM-based Techniques to Characterize Hot-deformation Behavior of Magnesium Alloys, 9th International Conference on Magnesium Alloys and their Applications”, Vancouver, BC, July 8-12, 2012.
21. Poster presented on “Electron Channeling Contrast Imaging (ECCI) on deformed Mg-Al-Ca alloys Using High Resolution Hitachi SU8000 FE-SEM”, American Society of Metals (ASM) International, Montreal Chapter, École de Technologie Supérieure, April 2012.
22. Poster presented on “Development of Imaging Techniques for Materials Characterization at Nanoscale”, 85th ACS Colloid and Surface Science Symposium, Montreal, QC, June 19-22, 2011.
23. Poster presented “On the Nucleation and Growth of Zinc Spangles during the Solidification of Hot-dip Galvanized Coatings”, 8th International Conference on Zinc and Zinc Alloy Coated Steel Sheet, Genova, Italy, June 21-25, 2011.
24. Talk on “Effect of Process Variables on the Solidification of Hot-dip Galvanized Coatings”, Materials Science and Technology 2010 (MS&T10), Houston, TX, October 17-21, 2010.
25. Poster presented on “Solidification of Hot-dip Galvanized Coatings”, American Society of Metals (ASM) International, Toronto Chapter, University of Toronto, 2009.

CONFERENCES and WORKSHOPS ORGANIZED

1. Co-organizer (with Robert Keller and Raynald Gauvin) of the Physical Sciences Symposium on “Advances in Scanning Electron Microscopy: Transmission Modes and Channeling Effects” in Microscopy and Microanalysis (M&M) Annual Meeting, St. Louis, MO, August 6-10, 2017.
2. Co-organizer (with Pamela Burnley) of the Hands-on Demonstrations of “Electron Backscatter Diffraction” in Extreme Crystals Workshops, High Pressure Science and Engineering Center (HiPSEC), University of Nevada, Las Vegas (UNLV), April 9-10 and October 7-9, 2016
3. Local reviewer of the Poster Sessions in 11th Annual GeoSymposium, Department of Geoscience, University of Nevada, Las Vegas (UNLV), April 29-30, 2016
4. Local organizer of the 25th Canadian Materials Science Conference (CMSC), Mining and Materials Engineering, McGill University, June 17-19, 2013.

5. Organizer of the First McMaster Materials Graduate Student Conference (MMGSC), Materials Science and Engineering, McMaster University, 2010.

COLLABORATIVE RESEARCH PROJECTS

1. Nanoscale Characterization of the Chemicals in Tire Crumb Using a Variable Pressure Field Emission Scanning Electron Microscope
Environmental Protection Agency (EPA)
Geoscience Department
University of Nevada, Las Vegas (UNLV)
(2016 - Present)
2. Collection of Selected Area Channeling Patterns (SACP) on Hot-Compressed Magnesium Alloys Using a Tescan FE-SEM
Center for Advanced Interconnect Science and Technology (NY CAIST), Albany, NY
Department of Materials Engineering, McGill University
(May 2014)
3. Imaging Dislocations in Hot-Compressed Magnesium Alloys using Electron Channeling Contrast Imaging (ECCI)
Max Planck Institute for Iron Research, Dusseldorf, Germany
Department of Materials Engineering, McGill University
(May 2013)

TEACHING EXPERIENCE

- Electron Backscatter Diffraction (EBSD) in Scanning Electron Microscopy
Faculty of Engineering, University of Nevada, Las Vegas (UNLV)
(Two Guest Lectures in 2016)
- Analytical and Characterization Techniques
- Transmission Electron Microscopy (TEM)
- Electron Beam Analysis of Materials
- Phase Transformations
Mining and Materials Engineering, McGill University
(2012-2014)
- Thermodynamics of Materials
Materials Science and Engineering, McMaster University
(2008-2010)
- Case Studies in the History of Technology
Chemical Engineering and Society, McMaster University
(2009)
- General Physics
College of Engineering, University of Tehran
(2007)

TECHNICAL SKILLS

- Extensive experience on theory and hands-on operation of scanning electron microscopes (SEM) and transmission electron microscopes (TEM)
- Extensive imaging experience with electron channeling contrast imaging (ECCI) and selected area channeling pattern (SACP) in SEM for deformation analysis
- Highly proficient with texture analysis in scanning electron microscope (SEM) using electron backscattered diffraction (EBSD) with Oxford HKL Channel5 data acquisition software and post-processing software
- Experience with weak beam dark field (WBDF) imaging, annular dark field imaging (STEM), selected area electron diffraction (SAED) and convergent beam electron diffraction (CBED) in TEM
- Experience with quantitative X-ray diffraction, X-ray microanalysis of heterogeneous materials using Monte Carlo programs including MC X-ray, Casino and Win X-ray
- Proficient with numerical analysis including Elastic Plastic Self Consistent (EPSC) modeling and programming using Matlab, C++ or Fortran
- Proficient with image analysis software including ImageJ
- Extensive experience with specimen preparation techniques for electron microscopy characterization of a variety of materials including metals and alloys, ceramics, minerals and biological specimens

(Updated in January 2016)