Aseel M. Bala

EDUCATION

Ph.D., Chemical Engineering — East Lansing, MI
Michigan State University — *Expected Graduation July 2018*

- Cumulative GPA: 3.96/4.00
- August F. and Ernest J. Frey Research Fund Award ($2500)
- Spartan Innovations Venture Fellowship ($6500)
- Future Academic Scholars in Teaching (FAST) Fellowship ($2000)

B.Eng., Chemical and Process Engineering — Muscat, Oman
Sultan Qaboos University — *2013*

- Cumulative GPA: 3.73/4.00
- Graduated with distinction
- Senior design project focusing on the production of power and synthetic natural gas from coal gasification

WORK EXPERIENCE

Graduate Research Assistant — East Lansing, MI
Dr. Carl Lira's Lab, Michigan State University — *Sept 2013 – Present*

- Dissertation Title: Fundamental Studies and Engineering Modeling of Hydrogen Bonding
- Related parameter constants of two commonly used association theories in thermodynamics
- Developed generalized expression for non-ideality of associating systems that can be combined with existing combinatorial and residual models
- Programmed an AspenPlus user model prototype to facilitate industrial use of the thermodynamic model
- Developed a novel method combining molecular and quantum mechanical methods to identify IR vibrations of different OH bonds in hydrogen bonded clusters
- Designing code protocols for running quantum mechanical and molecular mechanical simulations to more accurately interpret spectroscopic data
- Supervised 4 undergraduate students in computational and experimental aspects of the project

FAST (Future Academic Scholars in Teaching) Fellowship Graduate Leader — East Lansing, MI
The CIRTL Network, Michigan State University — *Sept 2017 – Present*

- Advising 12 fellows on their teaching-as-research projects in a variety of STEM fields
- Leading discussions in biweekly group meetings on effective teaching and learning principles
- Designing syllabus for program sessions focusing on teaching-as-research and community learning

Research Assistant — Muscat, Oman
Drs. Baba Jibril's and Joydeep Dutta's Labs, Sultan Qaboos University — *Sept 2012 – Aug 2013*

- Topics: Microwave assisted degradation of phenol over Ni/ZnO catalyst with and without hydrogen peroxide, effects of carbonization heating rate on activated carbon preparation for water treatment
- Determined reaction pathways of phenol degradation by observing product distributions under various combinations of nickel loading on nanocatalysts and presence of hydrogen peroxide as catalysts for reaction
- Optimized process by considering catalyst leaching and extent of degradation

Engineering Intern — Muscat, Oman
Petroleum Development Oman (PDO) — *Jun 2011 – Aug 2011*

- Developed static and dynamic simulations of an existing gas conditioning unit (GCU)
- Simulated artificially produced leak in GCU using Honeywell's Unisim Design Suite R390 to troubleshoot accident and improve safety measures on unit

PUBLICATIONS

- **Bala, Aseel M.**, Liu, R., Neuroth, G., Mathias, P. M., Patel, N. C., Frank, T. C., Vu, D. T., Cheluget, E.L. and Lira, C. T., "Applications of a Wertheim association activity coefficient model", *In Progress*
- **Bala, Aseel M.**, Killian, W. G., Storer, J. A., Killian W., Jackson, J. E. and Lira, C. T., "Integration of quantum calculations and spectroscopy for Wertheim alcohol association", *In Progress*
- **Bala, Aseel M.** and Lira, C. T., "Relation of Wertheim association constants to concentration-based equilibrium constants for mixtures with chain-forming components", *Fluid Phase Equilibria*, 430, pg. 47-56 (2016)
- **Bala Ahmed, A.**, Jibril, B., Danwittayakul and S., Dutta, J., "Microwave-enhanced degradation of phenol over Ni-loaded ZnO nanorods catalyst", *Applied Catalysis B: Environmental,* 156-157, pgs. 456-465 (2014)

CONFERENCE PRESENTATIONS

A Wertheim Activity Coefficient Model for Associating Mixtures — Minneapolis, MN
American Institute of Chemical Engineers (AIChE) Annual Meeting — *November 2017*

Development of an Association-Based NRTL Model — South Bend, IN
Midwest Thermodynamics and Statistical Mechanics Conference — *June 2017*

A Cooperative Learning Exercise to Improve Students' Understanding of Internal Energy — South Bend, IN
Midwest Thermodynamics and Statistical Mechanics Conference — *June 2017*

Effects of Cooperative Learning Intervention on Students' Understanding of the First Law of Thermodynamics
All-Network Teaching-As-Research Presentations, The CIRTL Network — *April 2017*

Thermodynamic Modeling of Hydrogen-Bonded Mixtures — San Francisco, CA
American Institute of Chemical Engineers (AIChE) Annual Meeting — *November 2016*

Comparison of Molecular Association Models — Oxford, OH
Midwest Thermodynamics and Statistical Mechanics Conference — *May 2016*

Development of an Association-Based Model for Bio-Derived Chemicals — Ames, IA
Midwest Thermodynamics and Statistical Mechanics Conference — *May 2015*

SERVICE AND OUTREACH

Lab Safety Representative — East Lansing, MI
Dr. Carl Lira's Lab, Michigan State University — *May 2014 – Sept 2017*

Student Success Panelist — East Lansing, MI
New TA Institute, Michigan State University — *August 2017*

Poster Evaluator — East Lansing, MI
2017 Mid-Michigan Symposium for Undergraduate Research Experiences (Mid-SURE) — *July 2017*

Peer Reviewer
Journal of Chemical and Engineering Data — *March 2017*

Michigan State University Student Representative — San Francisco, MI
2016 AIChE Recruitment Fair — *November 2016*

Activity Volunteer — East Lansing, MI
Women in Engineering: Introduce a Girl to Engineering Day, Michigan State University — *Feb 2016, Feb 2017*

Secretary — East Lansing, MI
Chemical Engineering and Materials Science Graduate Student Association, Michigan State University — *Sept 2015 – Sept 2016*

AWARDS AND FELLOWSHIPS

Spartan Innovations Venture Fellowship ($6500) East Lansing, MI
Michigan State University *Sept 2017 – Present*

August F. and Ernest J. Frey Research Fund Award ($2500) East Lansing, MI
Michigan State University *May 2017 – August 2017*

Future Academic Scholars in Teaching (FAST) Fellowship ($2000) East Lansing, MI
The CIRTL Network, Michigan State University *Sept 2016 – May 2017*

Two "Excellence" Awards Muscat, Oman
Sultan Qaboos University's Honor List *2008-2013*

Four "Distinction" and Two "Honors" Awards Muscat, Oman
College of Engineering Dean's Honor List, Sultan Qaboos University *2008-2013*

RELATED PROFESSIONAL SKILLS

- Using Microsoft Office and programming in Fortran, MATLAB and Bash shell scripting
- Using process simulation software including Honeywell's Unisim, AspenTech® HYSYS and AspenPlus® Process Simulation Software
- Designing molecular dynamic and quantum mechanical simulations with AMBER and Gaussian respectively
- Experimental methodology and data interpretation of various analytical techniques such as FT-IR, UV-VIS and NMR Spectroscopy

LANGUAGES

English
Native

Arabic
Proficient