

Musbah Mahfoud, Ph.D., P. ENG

Professor

Department of Metallurgical and Materials Engineering

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EXPERIENCE

- Over twenty four years of experience, including industrial, teaching, research, management, and supervision in Canada, Qatar, Libya and U.S.A.

AREAS OF EXPERTISE

- ***Industry Consultant:***
 - Hazelett Strip Casting Corporation, Vermont, United States of America.
 - UnitCast Canada, Sherbrook, Quebec, Canada
- ***Basic and Applied Research:*** Over eighteen years of research in industrial and academic settings.
- ***Teaching:*** Over fourteen years of teaching experience at the undergraduate and graduate levels in Canada, Libya and Qatar.
- ***Curriculum Development:*** Over five years of curriculum development at postsecondary Canadian institutions.
- ***Supervision:*** Four years of supervising experience in industrial and academic settings.
- ***Project Management:*** Over twelve years of experience in leading, managing and supervising industrial projects in industry and academia
- ***Quality Control:*** Over three years of industrial experience in developing and revising Standard Operating Procedures (ISO: 9000) for metal foundries.
- ***Product Improvement:*** Improved the mechanical properties of microalloyed steel pipes used in the oil and gas industries, eliminated inclusions in magnesium alloys and developed a new NDT method for improving the mechanical properties of aluminum alloys.
- ***Non-Destructive Testing:*** Certified NDT Inspector with more than five years of experience.

DISTINCTIONS

- First faculty member at the College of the North Atlantic-Qatar to be awarded seven successive applied research grants (2006-2010).
- First faculty member at Saskatchewan Institute of Applied Science and Technology, SK, Canada to be awarded both an external and internal applied research grants (2003-2005).
- The founder of the Aluminum Research Unit at the College of North Atlantic-Qatar (2007).
- Among the top 3% of the best engineering instructors, College of North Atlantic-Qatar 2007-2008.
- Graduated with honors, a Ph.D. degree from the Department of Metals and Materials Engineering at McGill University.
- Obtained three successive scholarships for undergraduate and graduate studies from both Canadian and international sources.
- Graduated as 1st student at high school and was one of the top ten students in the country (Libya).

IN PRESS

- http://www.oosa.unvienna.org/pdf/limited/c1/AC105_C1_2013_CRP02E.pdf
- http://www.saudinewstoday.com/article/31051_Qatar+University+Launches+Paper+Recycling+Project
- <http://www.qnrf.org/awarded/nprp/1>
- <http://www.qnrf.org/newsroom/newsletter/issue2.pdf>
- http://www.qnaol.net/QNAEn/Local_News/Misc/Pages/QatarUniversityLaunchesPaperRecy021032010.aspx
- <http://www.cna.nl.ca/qatar/PDFs/WVSEF.pdf>
- http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=341747&version=1&template_id=36&parent_id=16

AWARDS AND SCHOLARSHIPS

- 2008: Research project was selected among over 206 international projects by the Qatar Foundation for Innovation to establish the first AL research unit in the country
- 2005 : Excellence in Teaching Award, Saskatchewan Institute of Technology, Canada
- 2004: Saskatchewan Research Award
- 1997: Post Doctoral Scholarship, Natural Recourses Canada, NSERC
- 1991: Academic Achievement Award, McGill University
- 1990 –1992, 1995-1997: McGill University Graduate Scholarship (masters, Ph.D)
- 1983 –1989: The Atomic Energy Undergraduate Scholarship

MEMBERSHIPS

- Member of the World Academy of Science, Engineering and Technology
- Member of the Association of Professional Engineers and Geoscientists of Saskatchewan, Canada
- Member of the Canadian Journal of Calorimetry and Thermal Analysis
- Member of the American Society for Metals and Materials (ASM)
- Member of the American Society For Nondestructive Testing (ASNT)
- Member of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM)
- Member of the Experts Team of the ***Stars of Science*** Program launched by Qatar Foundation for Innovation, 2008.

SERVING ON COMMITTEES

- Judge and committee member, World Virtual Science and Engineering Fair, CNA-Q, 2007-2008.
- Coach and Mentor on the First Arabic TV program (Stars of Science), Qatar, 2009.
- Student Orientation Committee Member, CNA-Q, 2007
- Strategic Imperatives Communication Committee Member, CNA-Q, 2007
- Graduate Studies Committee, University of Saskatchewan, 2003-2006
- Foreign Students Orientation Committee, McGill University, 1994-1997
- Industrial-Academic Committee, SIAST, Saskatoon, Canada, 2002-2005
- Course Transfer Committee, SIAST-University of Saskatchewan, Saskatoon
- Focus Group Committees, CNA-Q, 2005-2006

EDUCATION

1997	Ph.D. (Materials Engineering) McGill University, Montreal, Quebec, Canada Thesis: Solidification and Casting of Aluminum Alloys Using Heat Pipe Technology
1992	Master of Engineering (Materials Engineering) McGill University, Montreal, Canada Thesis: Heat transfer and wettability studies. Findings from the research work resulted in developing a new ceramic coating for an industrial machine
1989	Bachelors of Engineering (Materials Engineering) Laurentian University, Sudbury, Ontario, Canada
1990	Master's Program in Chemistry

Course taken: Analytical Chemistry, Atomic and Molecular Spectroscopy, Physical Chemistry, Statistical Thermodynamics and Chemical Kinetics.
Laurentian University, Sudbury, Ontario, Canada

CERTIFICATES

- Experienced TESOL Teaching Certificate, *Education Canada*, 2002.
- NDT Level II Certifications, *Taloon NDT Center*, Aberdeen, Scotland, 2007
- Certificates of Achievement in ISO 9000 : 2000, *Proaction*, Sherbrook, Quebec, Canada (2001).
- Certificate of Achievement in Primavera Software tools for managing both small and large projects, Oracle University, 2008.
- Certificate of Facilitator Development Workshop, College of the North Atlantic-Qatar, June, 2007.

COMPUTER SKILLS

- Programming in Java, Java Scripts, Visual Basic, C++, Delphi and FORTRAN.
- Web Page Design, HTML and Internet Applications.
- Programming in Dynamic Data Exchange.
- AutoCAD, CATIA and Inventor.

EMPLOYMENT HISTORY

8/2012 – Present

Professor

Department of Metallurgical and Materials Engineering
University of Tripoli, Tripoli, Libya

09/2014-09/2015

Visiting Professor

Welding/Mechanical Engineering Technology
School of Manufacturing and Automation
Southern Alberta Institute of Technology
Calgary, Alberta, Canada

10/2010 – 8/2012

Associate Professor

Department of Metallurgical and Materials Engineering
University of Tripoli , Tripoli, Libya

04/2012 – 04/2013

General Director

Libyan Center for Remote Sensing and Space Science, Tripoli, Libya

9/2008– 8/2010

Director of the Materials Research Unit

College of the North Atlantic-Qatar, Doha, Qatar

8/2005– 8/2008

Instructor / Program Head

Department of Mechanical Engineering Technology

College of North Atlantic-Qatar, Doha, Qatar

3/2004 – 3/2009

Sessional Instructor/Adjunct Professor

Department of Mechanical Engineering

University of Saskatchewan, Saskatoon, Canada

8/2002 – 7/2005

Instructor

Department of Mechanical Engineering Technology

Saskatchewan Institute of Applied Science and technology, Saskatoon, Canada

1/2000 - 7/2002

Quality Control Engineer

Unitcast Canada Inc., Sherbrooke, Quebec, Canada

“Green Sand Steel Foundry”

- Analyzed and documented a metal plant layout, modified ISO9000 procedures, recommended plans to improve the mechanical properties of company products and reduce manufacturing costs.

1/1998 – 12/1999

Process Engineer

Timminco Metals, (Non-Ferrous Metals Producer), Haley, Ontario, Canada

Responsibilities:

- Monitored on a daily, weekly and monthly basis, operating practices and equipment capabilities of the plant production processes.
- Developed preventive maintenance plans, determined causes for material failures and made recommendations to minimize the frequency of occurrence.
- Developed and revised standard operating procedures, ISO 9000 for plant operations.

7/1997 - 12/1997

Postdoctoral Fellow

McGill University in collaboration with Cominco Ltd, Trail, British Columbia, Canada

“Cominco Limited is a precious metal producer”

11/1992 - 7/1994

Research Engineer

Hazelett Strip Casting Corp., VM, U.S.A.

GRANTED RESEARCH FUNDING

Granting Agency	Subject	\$US	Year(s)	Principal Investigator	Co-Investigator
Qatar National Research Fund	Establishment of a Paper Recycling Technology Center in Qatar	90,000	2010-2011	M. Mahfoud	Mariam AlMa'adeed & D. Emadi
Qatar National Research Fund	Development of a Thermal Analysis System for Predicting the Solidification Characteristics of Metals	40,000	2010-2011	D. Emadi	M. Mahfoud
Qatar National Research Fund	Development and Characterization of Lightweight Magnesium Nanocomposites for Weight Critical Applications	1,020,000	2009-2012	Manoj Gupta	Musbah Mahfoud, A. Hamouda
Qatar National Research Fund	Ecological Sustainability of Fiber Optic Solar Lighting in the Future of the State of Qatar	40,000	2008-2009	Musbah Mahfoud	Jamal Kurdi
Qatar National Research Fund	Development of New Aluminum Alloys and Recycling Technologies	531,000	2008-2010	Musbah Mahfoud	D. Emadi, A., A. Hamouda
Qatar National Research Fund	CNA-Q Baja SAE Competition Participation	60,000	2007-2008	Musbah Mahfoud	Shariq Khan
Qatar National Research Fund	The Use of Solar Energy in Qatar	10,000	2006-Present	Musbah Mahfoud	Ahmad Marzooq
College of North Atlantic-Qatar	Aluminum Processing	6,000	2007	Musbah Mahfoud	
National Research Canada	Fatigue Behaviour of Magnesium Alloys	30,000	2004 - 2005	Musbah Mahfoud	
SIAST Research Equipment Grant	Thermal Analysis of Aluminum Alloys	62,000	2003	Musbah Mahfoud	
Natural Science and Eng Research Canada	The Use of Heat Pipe Technology in Aluminum Casting	105,000	1995 - 1997	Dr, John Gruzleski, Dr.	Musbah Mahfoud
Hazelett Strip Casting Corp., Vermont, USA	The Use of Ceramic Coatings to Improve the Castability of Aluminum Alloys	35,000	1992	Musbah Mahfoud	Rod Guthrie

COURSES HAVE BEEN TAUGHT

□ **Southern Alberta Institute of Technology, School of M&A, Dep. of Mechanical/Welding Engineering Technology:**

Courses: Materials Engineering, Metallurgy of Welding, Thermodynamics and Strength of Materials.

□ **University of Tripoli:**

Undergraduate Courses: Introduction to Materials, Selection of Engineering Materials, Non-destructive Testing, Engineering Thermodynamics, Strength of Materials, Solidification Processing.

Graduate Courses: Physical Metallurgy of Non-Ferrous Alloys, Advanced Casting Techniques. Environmental Awareness, Quality Control and Engineering Economics.

□ **University of Saskatchewan and Saskatchewan Institute of Applied Science and Technology (Departments of Mechanical Engineering):**

Materials Science, Strength of Materials, Mechanics of Materials, and Thermodynamics, Design and Selection of Engineering Materials, and Solidification and Casting of Metals and Alloys (graduate course).

□ **McGill University:**

Courses: Heat, Mass and Fluid flow, Iron and Steel Making (Lecture Tutorials and Lab demonstrations).

□ **College of the North Atlantic-Qatar, Mechanical Engineering Program:**

Courses: Materials Manufacturing Processes, Mechanics of Materials (Statics, Dynamics), Strength of Materials, Fluid Mechanics, Non-destructive Testing, Analytical Chemistry,

PUBLICATIONS

Selected Peer-reviewed Journal Publications

- **M. Mahfoud** and Prasad Ayyagari “A Method for Predicting the Chemical Composition of Recycled Aluminum Alloys”,
Advanced Materials Research Journal, Volume: 576 (2012) pp 671- 674, 2012.
ISBN: 978-3-03785-498-3
Publisher: Trans Tech Publications
Link: <http://www.ttp.net/978-3-03785-498-3/15.html>
- D. Emadi, and **M. Mahfoud** “Correlation of Mechanical Properties of Cast 3XX Alloys to Processing Variables and Alloy Chemistry Using Regression Analysis and Artificial Neural Network Techniques”,
Advanced Materials Research Journal, Volume: 463-464 (2012) pp 439-443.
ISSN: 1022-6680
Publisher: Trans Tech Publications
Link: <http://www.scientific.net/AMR.463-464.439>
- Daryoush Emadi and **Musbah Mahfoud**, “Comparison of Artificial Neural Network and Multiple Regression Analysis Techniques in Predicting the Mechanical Properties of A3 56 Alloy”
Journal of Procedia Engineering, Volume: 10 (2011-01) pp. 589-594

ISSN: 1877-7058

Publisher: ELSEVIER

Link: <http://www.sciencedirect.com/science/article/pii/S1877705811002864>

- D. Emadi, A.K. Prasada, **M. Mahfoud**, “Influence of Scandium on the Microstructure and Mechanical Properties of A319 Alloy”
Journal of Materials Science and Engineering A, Volume 527, Issue 23, 2010, pp. 6123-6132.
ISSN: 0921-5093
Publisher: ELSEVIER SCIENCE SA
Link: <http://www.sciencedirect.com/science/article/pii/S0921509310006751>
- **M. Mahfoud**, and D. Emadi, “Aluminum Recycling-Challenges and Opportunities”
Journal of Advanced Materials Research, Vols. 83-86, 2010, pp. 571-578.
ISSN: 1022-6680
Publisher: Trans Tech Publications
Link: <http://www.scientific.net/AMR.83-86.571>
- **M. Mahfoud**, A.K. Prasada Rao and D. Emadi, “The Role of Thermal Analysis in Detecting Impurity Levels During Aluminum Recycling”,
Journal of Thermal Analysis and Calorimetry, Volume 100 [HYPERLINK "http://www.springerlink.com/content/h57111772848/?p=92030422140a4a82b80a96ae19412c39&pi=0"](http://www.springerlink.com/content/h57111772848/?p=92030422140a4a82b80a96ae19412c39&pi=0) [HYPERLINK "http://www.springerlink.com/content/h57111772848/?p=92030422140a4a82b80a96ae19412c39&pi=0"](http://www.springerlink.com/content/h57111772848/?p=92030422140a4a82b80a96ae19412c39&pi=0) 3, June, 2010, pp. 847-851.
ISSN: 1388-6150
Publisher: Springer
Link: <http://www.springerlink.com/content/xp005700l3680580/>
- A. Prasada Rao, and **M. Mahfoud**, “Effect of Cadmium on the Microstructure of Al-7Si alloy”,
Journal of Alloys and Compounds, Vol.491, 2010, pp. L8–L10.
ISSN: 0925-8388
Publisher: ELSEVIER
Link: <http://www.sciencedirect.com/science/article/pii/S092583880902180X>
- Subodh K. Das, John A.S. Green, J. Gilbert Kaufman, Daryoush Emadi, and **M. Mahfoud**,
“Aluminum Recycling—An Integrated, Industrywide Approach”, , Volume 62, Number 2 / February, 2010, pp. 23-26.
ISSN: 1047-4838
Publisher: Springer
Link: <http://adsabs.harvard.edu/abs/2010JOM....62b..23D>
Link: <http://www.springerlink.com/content/v05603g818360260/>
- **M. Mahfoud**, F. Mucciardi and J.E. Gruzleski; “Numerical Simulation of Heat-Pipe Assisted Solidification”,
International Journal of Cast Metals Research (UK), Vol. 18, No. 3, 2005. pp. 149-155
ISSN: 1364-0461
Publisher: [Maney Publishing](http://www.maneypublishing.com)

Link:

<http://www.ingentaconnect.com/search/article?option1=tka&value1=Numerical+Simulation+of+Heat-Pipe+Assisted&pageSize=10&index=1>

- **M. Mahfoud** and D. Emadi, “Application of Heat Pipe Technology in Thermal Analysis of Metals”,
Journal of Thermal Analysis and Calorimetry, Vol. 81, 2005, 161-167.
ISSN: 1388-6150
Publisher: Springer
Link: <http://www.springerlink.com/content/v40752347w2q1637/>
- **M. Mahfoud**, F. Mucciardi and J.E. Gruzleski; “On-Line Control of Heat Extraction During Thermal Analysis of Aluminium Alloys”,
International Journal of Cast Metals Research (UK), Vol. 10, No.4, 1998, pp. 191-200.
- **M. Mahfoud**, F. Mucciardi and J.E. Gruzleski; “Detection of Reactions Using Heat Pipe Technology”,
Transactions of the American Foundrymen’s Society, No. 25, Vol. 105, 1997, pp. 473-480.
ISSN: 0065-8375
Publisher: American Foundrymen's Society
Link: <http://www.afsinc.org/content/view/1228/192>

Selected Peer-reviewed Conference Proceedings

- **Musbah Mahfoud** and Ibtisam Mustafa., “The Effect of Vanadium Addition on the Mechanical Properties and Microstructure of A319 Aluminum Alloy”, *The International Conference on materials Applications*, , April 22 – 23, 2014, Istanbul, Turkey.
- **M. Mahfoud** and Prasad K., “Effect of Scandium Addition on the Mechanical Behavior of Aluminum 319 Recycled Alloy”, *APMAS 2013 3rd international advances in applied physics and materials science congress*, April 24 – 28, 2013, Antalya, Turkey.
- **M. Mahfoud** and M. Shaikh, “Ecological Sustainability of Fiber Optic Solar in the Lighting Future of the State of Qatar” *ASME 2010, 4th International Conference on Energy Sustainability*, 17-22 May 2010. Phoenix, Arizona, United States.
ISBN: 0-7918-4395-6 » ES2010-90484,
Link:
<http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=ASMECP002010043956000399000001&idtype=cvips&gifs=yes&ref=no>
- S. Das, J. Kaufman, J. Green, D. Emadi, and **M. Mahfoud**, “A New Approach in Alloy Design for Aerospace Applications”, *AMPT 2009 (Advances in Materials and Processing Technologies)*, Kuala Lumpur, Malaysia, 26 - 29 October 2009.
Link: http://www.iium.edu.my/ampt2009/oc2/chair/list_abs_acc2.php
- S. Das, J. Kaufman, J. Green, D. Emadi, and **M. Mahfoud**, “Development Of Alloy Recycling Indices For Aerospace Aluminum Alloys”, *AeroMat 2009*, June 9, 2009, Dayton , Ohio, USA
Link: http://asm.confex.com/asm/aero09/techprogram/paper_25135.htm

- **M. Mahfoud** and D. Emadi, “*Effect of Trace Elements on the Prospect of Aluminum Recycling*”, **the 2nd International Aluminium Casting Conference & Exhibition**”, Moscow, Russia, April 1-3, 2009.
Link: http://eng.alusil.ru/confirmed_papers
- A. Marzooq and **M. Mahfoud**, “*Design and Construction of a Heat Absorption System Operating With Solar Energy for Cooling in the State of Qatar*”, **1st International Conference on Solar Heating, Cooling and Buildings**, EUROSUN, Lisbon, Portugal, 7 – 10 October, 2008.
Link: <http://www.qscience.com/doi/abs/10.5339/qnrs.2011.2995>
- **M. Mahfoud** and John Adigun, “*Sensitization Effect on the Mechanical Properties and Intergranular Corrosion of Al-Mg Alloys*”, **The Fifth Arab Congress on Materials Science**, Gabès, Tunisia, 23-25 October, 2007.
- **M. Mahfoud** and D. Emadi “*Application of Thermal Analysis in the Aluminum Industry*”, **the 2nd International Conference on Advances in Production and Advances of Aluminium**, 5-7 Dec., 2005, Kingdom of Bahrain.
- **M. Mahfoud**, D. Emadi and S. Yanacopoulos, “*Fatigue Crack Growth Characterization of Sand Cast Magnesium Alloy AM60B*”, **Proceedings of the 4th Materials Science Conference**, Tripoli, Libya, Sept. 2005.
- **M. Mahfoud** and D. Emadi, and S. Yanacopoulos, “*Effect of Grain Refinement on the Tensile and Fatigue Crack Growth Properties of Sand Cast AM60 Magnesium Alloy*”, **Proceedings of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM)**, Calgary, Canada, Aug. 2005.
Link: http://www.metsoc.org/conferences/com2005/pdfs_word/session6.pdf
- **M. Mahfoud**, F. Mucciardi and J.E. Gruzleski ; “*Semi-continuous Thermal Analysis*” **Proceedings of the International Symposium on Light Metals**, Montreal, Quebec, Aug. 25-29, 1996, pp.161-170.
- Musbah Mahfoud, “*Canadian Education and its Effect on Diversity in the State of Qatar*”, The Seventh International Conference on Diversity in Organizations, Communities and Nations, Amsterdam, The Netherlands, 3-6 July 2007
Link: http://d07.cgpublisher.com/proposals/184/index_html
- D. Emadi and **M. Mahfoud**, “*Impact of impurities on the Properties of Secondary Al-Si-Cu alloys*”, **The Minerals, Metals & Materials Society (TMS) Conference**, February 14-18, 2010 , Seattle, WA, U.S.A.
Link:
<http://www.programmaster.org/PM/PM.nsf/ApprovedAbstracts/6B75A344FDD40E6A85257661001B6F00?OpenDocument>
- **M. Mahfoud**, F. Mucciardi and J.E. Gruzleski; “*Controlled Thermal Analysis Using Heat Pipe Technology*”, **The Ninth Canadian Materials Science Conference**, June 17-20, 1997, McGill University, Montreal, Quebec.

Technical Reports: Confidential reports submitted to North American industry.

- M. Mahfoud “Feasibility Study of Casting Magnesium-Steel Using Unitcast’s Electric Arc Furnace”, a report submitted to Unitcast Canada, 2001.
- M. Mahfoud, “A Proposed New Method of Sand Cleaning and Reclamation”, a report submitted to Unitcast Canada, 2001.
- M. Mahfoud, “A Proposed New Ceramic Coating for Conveyor Moulds, an internal report submitted to Timminco Metals, Haley, Ontario, 1999.
- M. Mahfoud,” Improving the Recovery of Cast Billets and Blooms”, an internal report submitted to Timminco Metals, Haley, Ontario, 1998.
- M. Mahfoud, “A New Method for Metal Delivery and Inspection of Melting Pots”, an internal report submitted to Timminco Metals, Haley, Ontario, 1998.
- M. Mahfoud, Ning Jing, and F. Mucciard, “Heat Pipes for Measuring the Boundary Conditions in a Copper Drossing Furnace, and Zinc Fluidized Bed Roaster”, A confidential report submitted to Cominco Limited (now named Teck Cominco), Trail, British Columbia, 1998.
- Mahfoud and R. Guthrie; “The Wettability of Ceramic-Coated Substrates by Liquid Aluminum”, An Internal report submitted to Hazelett Strip Casting Corporation, Colchester, Vermont, U.S.A, Sept., 1993.
- M. Mahfoud and W. Dressler, “The Effect of Nickel On Carbon During the Reduction of Chromite”, a confidential report submitted to Inco Inc., Sudbury, Ontario, 1990.

Books

- Musbah Mahfoud, “*Controlled thermal analysis using heat pipe technology*”, (Ph.D. thesis), **Publisher:** McGill University, 1997
Link: http://digitool.library.mcgill.ca/R/?func=dbin-jumpfull&object_id=34663&local_base=GEN01-MCG02
- Musbah Mahfoud, *The wettability of ceramic-coated steel substrates by liquid metals*: (master’s thesis) **Publisher:** McGill University, 1992
Link: <http://www.worldcat.org/title/wettability-of-ceramic-coated-steel-substrates-by-liquid-metals/oclc/61560901>
- **Musbah Mahfoud**, “*The Effect of nickel on carbon during the reduction of chromite*”, (honours bachelor thesis), 1989 **Publisher:** Laurentian University, 1989
Link: http://openlibrary.org/works/OL12954441W/The_Effect_of_nickel_on_carbon_during_the_reduction_of_chromite