



## Dr.-Ing. Ahmed Tamer AlMotasem AlAsqalani

Faculty of mechanical Eng-University of Southampton, So17 1BJ Southampton, UK

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## Personal

Name	AlMotasem, Ahmed Tamer
Gender	Male
Date and Place of Birth	25.11.1978, Assiut
citizenship	Egyptian
current residence	Broadlans Rd, 236- SO17 3AS Southampton-UK
Date of writing C. V	25.03.2019

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## EDUCATION

Date

- **Ph.D.** (Mechanical Engineering), (Grade: Magna Cum Laude) 2008- 2012  
*Technical university Dresden, Germany*  
Advisor: Dr. Matthias Posselt (Helmholtz-Zentrum Dresden Rossendorf)  
Dissertation: "Nanoclusters in Diluted Fe-Based Alloys Containing Vacancies, Copper and Nickel: Structure, Energetics and Thermodynamics"  
([link to PhD Thesis](#))
- **Graduate Studies at Helsinki University of Technology, Finland** 2007-2008
- **M. Sc. Solid state Physics** 2002-2005  
Assiut University- Egypt  
Advisor: Prof. Mohammed Hafiz (Faculty of Science)  
Thesis: Study of Some Physical Properties of Ge-Se-Bi Chalcogenide Glassy Thin Films
- **Dipl. Physics**, (Grade: very good) Assiut University- Egypt 2000-2001
- **B. Sc.** in Physics (Grade: very good with honor), 1997-2000  
Faculty of Science-Assiut University- Egypt

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## Linguistic skills

<b>Arabic</b>	Native
<b>English</b>	Full professional proficiency (Interagency Language Roundtable Level 4)
<b>German</b>	Elementary proficiency (Interagency Language Roundtable Level 2)

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## Current Position

- **Research Fellow** 2/2019-present  
*Faculty of Mechanical Engineering, Southampton University.*

- Studying deformation behavior of polycrystalline materials, Energetics and thermodynamics of precipitates in metallic alloys, Interfacial and Fatigue fracture of metallic alloys.

## Previous Employments

- Post-Doctoral Researcher** 2/2015-2/2017  
*Department of Physics and engineering-Karlstad University-Sweden*  
 Supervisor: Prof. Jens Bergström  
 Funded by: Knowledge Foundation Sweden.  
 Performing MC/MD simulation to improve the wear resistance of Steels in collaboration with industrial partner (Atlas Copco, Sandvik)
  - Post-Doctoral Researcher** 11/2013-11/2014  
*School of Mechanical Engineering-Ulsan (Republic of Korea)*  
 Supervisor: Prof. Seung Tae Choi  
 Investigate crack growth and propagation in ferritic steels using atomistic modeling.
  - Ph. D student** 2008-2012  
 Helmholtz-Zentrum Dresden Rossendorf (Germany)  
 I have used Mitropolis Monte carlo method and Molecular Dynamics simulations to investigate the structure, energetics and thermodynamics of nanoclusters embedded in iron matrix, such study is important to understand the degradation of mechanical properties of steels during irradiation
  - Research Assistant** 4-7/2010  
 The chair of materials science and nanotechnology, Dresden, Germany  
 Advisor Dr. Claudia Gomes da Rocha (now at Trinity College Dublin, Ireland)  
 Studying "Testing the sensing ability of graphene nanoribbons by edge doping: An atomistic study".
  - Guest Researcher** 10-12/2008  
*Forschungszentrum Dresden-Rossendorf (Germany)*  
 Advisor: Dr. Matthias Posselt  
 Working on Atomistic simulation of defects formation in solids
  - Guest Researcher** 2007-2008  
*Helsinki University of Technology (Finland)*  
 Working on MD simulation of nanoindentation (computational nanomechanics)
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## Academic merits

### Scientific Reviewer

- Tribology Letters (Springer, ISSN: 1023-8883)
- Tribology International (Elsevier, ISSN: 0301-679X)
- Computational Materials science(Elsevier,ISSN: 0927-0256)
- Arabian Journal for Science and Engineering (Springer, ISSN: 2193-567X)

(Verified reviews can be found at <https://publons.com/author/1349802/ahmed-tamer-almotasem- alasqalani#profile>)

## **Memberships in Scientific Societies**

- The Austrian Society for Metallurgy and Materials(ASMET). 2015
- Korean society of mechanical Engineers (KSME). 2013
- Session Co-Chairman, 17th International Conference on Tribology and Interface Engineering, Venice, Italy, November 9 - 10, 2015  
<http://waset.org/conference/2015/11/venice/program>.
- Coordinator for introduction to atomistic modeling using lammmps session, LinkSCEEM-2 FP7, in collaboration with forschungszentrum Juelich and Cyprus Institute, Alexandria library 25-27 June, 2013.  
<http://linksceem.cyi.ac.cy/ls2/images/stories/MolecularDynamicsBasics.pdf>

## **Awards**

- Fellow of DAAD for outstanding undergraduate student at (PTB) Germany, 7-9/1999.
  - Received ‘‘ELLA AND GEORG EHRNROOTH’’ research fund (Finland), 2008.
  - Ph.D scholarships fully funded by german government, 2008.
  - Received ‘‘Brain Korea 21’’ Postdoc fund (South Korea), 2013.
  - Postdoc position fully funded by Swedish government, 2015
  - Postdoc position fully funded by Uk government, 2019
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## **Computer skills**

<b>Operating Systems</b>	Linux(Ubuntu-Redhat), Windows.
<b>Programming</b>	Fortran, Python, Awk and bash.
<b>High Performance Computing(HPC)</b>	Setting-up Linux cluster, installing queuing and scheduling on cluster (Turque and Maui), <ul style="list-style-type: none"> <li>• Swedish National Infrastructure for Computing (TRIOLITH)</li> <li>• High Performance Computing at HZDR, Germany (hypnos, hydra)</li> <li>• High availability supercomputing center Assiut university, Egypt</li> </ul>
<b>Others</b>	Latex, MS Office, Open Office, Gnuplot, Origin, Mathemateca.

## **Technical skills**

<b>MD codes</b>	PARCAS, MOLDY, ASE, XMD, LAMMPS and GULP.
<b>Ab initio/DFT</b>	VASP, QUANTUM ESPRESSO
<b>Others</b>	Monte Carlo methods-Cluster expansion, atomsk
<b>Visualization</b>	Ovito, VMD and RASMOL

## **Research Interest**

- (i) Energetics and thermodynamics of precipitates in metallic alloys.
- (ii) Segregation of solute atoms to ferrite grain boundary using hyperide semi-grand canonical monte carl /molecular dynamics.
- (iii) Simulation of point defects, linear, planner and stacking faults in solid.
- (iv) Wear and plastic deformation behavior of single and polycrystalline ferrite iron
- (v) Interfacial and Fatigue fracture of metallic alloys.

## MAJOR COLLABORATIONS

- **Dr. Matthias Posselt** (PhD advisor)  
*Helmholtz-Zentrum Dresden Rossendorf-Germany*  
**Topic:** i) Fracture of ferrite iron using atomistic modeling, ii) strengtheng of steels by grain boundary segregated alloying elements.
- **Dr. Lorenzo Malerba**  
*Belgian Nuclear Research Centre, sck, Belgium*  
**Topic:** dislocation-solute interaction in neutron-irradiated steels.
- **Prof. Seung Tae Choi** (Postdoc supervisor)  
Chung-Ang University, Seoul, South Korea  
**Topic:** multi-scale modeling of crack-inclusion interaction in steels.
- **Prof. Jens Bergström** (Postdoc supervisor)  
*Department of Physics and engineering-Karlstad University-Sweden.*  
**Topic:** *Effect of Carbon& nitrogen on Fatigue and Wear of ferritic steels*
- **Prof. Pavel Krakhmalev**  
*Department of Physics and engineering-Karlstad University-Sweden*  
**Topic:** investigation of wear and Fatigue of steels by means of atomic level simulation
- **Dr. Anders Gåård**  
*Department of Physics and engineering-Karlstad University-Sweden.*  
**Topic:** Improve tool wear resistance by microstructure modification.

## References

### **Dr. Matthias Posselt (Ph.D main Advisor)**

Address: Helmholtz-Zentrum Dresden Rossendorf

E-mail: [m.posselt@hzdr.de](mailto:m.posselt@hzdr.de)

<http://www.hzdr.de/db/Cms?pOid=11578&pNid=0>

### **Prof. Jens Bergström**

Address: Karlstad University, Dept. of Engineering and Physics, 65188 Karlstad, Sweden

Tel.: +46 54 700 1259

E-mail address: [jens.bergstrom@kau.se](mailto:jens.bergstrom@kau.se)

**Prof. Anders Gård**

Address: Karlstad University, Dept. of Engineering and Physics, 65188 Karlstad, Sweden

Tel.: +46 54 700 1262

E-mail address: [anders.gaard@kau.se](mailto:anders.gaard@kau.se)

**Prof. Pavel Krakhmalev**

Address: Karlstad University, Dept. of Engineering and Physics, 65188 Karlstad, Sweden

Tel.: +46 54 700 2036

E-mail address: pavel. Krakhmalev @kau.se

## **Publication List**

### **Peer-reviewed Journals**

**(2018)**

- 1) **Al-Motasem, A.T., Posselt, M.,** and Bergström, J, Nanoindentation and nanoscratching of a ferrite/austenite iron bicrystal: An atomistic study, Tribology International, Vol-127, pp:231-239.  
<https://doi.org/10.1016/j.triboint.2018.06.017>

- 2) **Al-Motasem, A.T.** Posselt, M., Deformation behavior of nanocrystalline ferrite with segregated foreign interstitial: A molecular dynamics study, (under review Journal of Iron and Steel Research International)

**(2017)**

- 3) **Al-Motasem, A.T.,** Bergström, J., Gåård, A., Krakhmalev, P., Holleboom, L. J. Atomistic Insights on the Wear/Friction Behavior of Nanocrystalline Ferrite During Nanoscratching as Revealed by Molecular Dynamics, 65:101 Tribol Lett, (2017)1-13.  
<http://dx.doi.org/10.1007/s11249-017-0876-y>

- 4) **Al-Motasem, A.T.,** Bergström, J., Gåård, A., Krakhmalev, P., Holleboom, L. J. Tool microstructure impact on the wear behavior of ferrite Iron during nanoscratching: An atomic level simulation, 370-371 WEAR, (2017)39-45.  
<http://dx.doi.org/10.1016/j.wear.2016.11.008>

**(2016)**

- 5) **Al-Motasem, A.T.,** Bergström, J., Gåård, A., Krakhmalev, P., Holleboom, L. J. Adhesion between ferrite iron-iron/cementite countersurfaces: A molecular dynamics study. Tribology International, <http://dx.doi.org/10.1016/j.triboint.2016.06.027>

- 6) **Al-Motasem, A. T.,** Gåård, A., INFLUENCE OF CHEMICAL COMPOSITION ON ADHESION IN METALLIC CONTACTS. International Journal of Advances in Science Engineering and Technology, Vol-4, Iss-3, Spl. Issue-1 Aug.-2016

- 7) **Al-Motasem, A. T.,** Maia, N. T., Choia, S. T., Matthias, P., Atomistic study on mixed-mode fracture mechanisms of ferrite iron interacting

with coherent copper and nickel nanoclusters. J. NUCL. MATER, 472(2016)20.

<http://dx.doi.org/10.1016/j.jnucmat.2015.12.046>

### (2012)

- 8) Talati, M., Posselt, M., Bonny, G., **Al-Motasem, A. T.**, and Bergner, F, Vibrational contribution to the thermodynamics of nanosized precipitates: vacancy-copper clusters in bcc-Fe. J. Phys.: Condens. Matter, 24(2012)225402.

<http://iopscience.iop.org/0953-8984/24/22/225402/>

### (2011)

- 9) Terentyev, D., Malerba, L., Bonny, G., **Al-Motasem, A. T.**, and Posselt, M. Interaction of an edge dislocation with Cu-Ni-vacancy clusters in bcc iron. J. NUCL. MATER, 419(2011)134.

<http://dx.doi.org/10.1016/j.jnucmat.2011.08.021>

- 10) **Al-Motasem, A. T.**, Posselt, M., and Bergner, F. Nanoclusters in bcc-Fe containing vacancies, copper and nickel: Structure and energetics. J. NUCL. MATER, 418(2011)215.

<http://dx.doi.org/10.1016/j.jnucmat.2011.07.002>

- 11) **Al-Motasem, A. T.**, Posselt, M., Bergner, F., and Birkenheuer, U. Structure, energetics and thermodynamics of copper-vacancy clusters in bcc-Fe: An atomistic study. J. NUCL. MATER, 414(2011)161.

<http://dx.doi.org/10.1016/j.jnucmat.2011.02.051>

### (2007)

- 12) Hafiz, M.,M. , Othman, A., A., El-Nahass, M., M., and **Al-Motasem, A. T.**, Photoinduced effects on the optical constants of a-GeSeBi chalcogenide glassy thin films. RADIAT EFF DEFECT S, 162(2007)696.

<http://dx.doi.org/10.1080/10420150601119179>

- 13) Hafiz, M.,M. , Othman, A., A., El-Nahass, M., M., and **Al-Motasem, A. T.**, Composition and thermal-induced effects on the optical constants of  $\text{Ge}_{20}\text{Se}_{80-x}\text{Bi}_x$  thin films. PHYSICA B, 390(2007)348.

<http://dx.doi.org/10.1016/j.physb.2006.08.036>

- 14) Hafiz, M.,M. , Othman, A., A., El-Nahass, M., M., and **Al-Motasem, A.T.**, Composition and electric field effects on the transport properties of Bi doped chalcogenide glasses thin films. PHYSICA B, 390(2007)286.

<http://dx.doi.org/10.1016/j.physb.2006.08.025>

## **CONFERENCE PAPERS**

**Al-Motasem, A.T.**, Bergström, J., Gåård, A., Krakhmalev, P., Holleboom, L. J., A MOLECULAR DYNAMIC STUDY ON THE INFLUENCE OF CARBIDE PARTICLES IN FERRITE ON MATERIAL TRANSFER DURING NANOSCRATCHING OF FERRITIC IRON. 10th Tool conference (Tool2016) - October 4-7, 2016, Bratislava, Slovakia.

**Al-Motasem, A. T.**, Gåård, A., INFLUENCE OF CHEMICAL COMPOSITION ON ADHESION IN METALLIC CONTACTS. 45th International Conference on Nanoscience, Nanotechnology and Advanced Materials (IC2NM) - June 21-22, 2016, Bangkok, Thailand.

**Al-Motasem, A. T.**, Choi, S. T., Molecular Dynamics Study on the Fracture of Ferrite Iron Containing Coherent Copper and Nickel Nanoclusters. KSME (Korean Society of Mechanical Engineers) Conference- Materials and Fracture Division- November 11-13, 2014, Kwango, Republic of Korea.

**Al-Motasem, A. T.**, Choi, S. T., Ju-Hyung Song, MOLECULAR DYNAMICS STUDY ON MIXED-MODE FRACTURE ALONG SYMMETRIC-TILT GRAIN BOUNDARIES OF GRAPHENE, KSME (Korean Society of Mechanical Engineers) Conference- Materials and Fracture Division- April 3-4, 2014, Jeju, Republic of Korea.

Talati, M., Posselt, M., Bonny, G., **Al-Motasem, A. T.**, Bergner, F. Investigations of structure, energetics, thermodynamics and kinetics of copper-vacancy clusters in bcc-Fe. European Nuclear Young Generation Forum (ENYGF), 17.-22.05.2011, Prague, Czech Republic.

## **PRESENTATIONS IN INTERNATIONAL CONFERENCES**

**Al-Motasem, A.T.**, Bergström, J., Gåård, A., Krakhmalev, P., Holleboom, L. J. Effect of Carbide Precipitates in Tool Steel on Material Transfer: A Molecular Dynamics Study. ICTIE 2015: 17th International Conference on Tribology and Interface Engineering, Venice, Italy.

**Al-Motasem, A. T.**, Choi, S. T., Molecular dynamics study on mixed-mode fracture along symmetric-tilt grain boundaries of graphene, KSME (Korean Society of Mechanical Engineers)- Materials and Fracture Division- Spring Conference April 3-4, 2014, Jeju, Republic of Korea.

**Al-Motasem, A. T.**, Posselt, M., Bergner, F., Birkenheuer, U. Structure and energetics of nanoclusters in bcc-Fe containing vacancies, Cu, and Ni, E-MRS 2011 SPRING MEETING IUMRS ICAM 201 1 & E-MRS/MRS BILATERAL CONFERENCE on ENERGY, May 9-13, 2011, Nice, France.



Talati, M., Posselt, M., Bonny, G., **Al-Motasem, A. T.**, Bergner, F. Vibrational Effects on Thermodynamics of Copper-Vacancy Clusters in bcc-Fe, E-MRS 2011 SPRING MEETING IUMRS ICAM 2011 & E-MRS/MRS BI-LATERAL CONFERENCE on ENERGY, May 9-13, 2011, Nice, France.

**Al-Motasem, A. T.**, Posselt, M., Bergner, F., Birkenheuer, U. Structure and energetics of nanoclusters in bcc-Fe containing vacancies, Cu, and Ni, DPG Frhjahrstagung , 13.-18.03.2011, Dresden, Germany.

**Al-Motasem, A. T.**, Posselt, M., Bergner, F. Nucleation of Cu-vacancy and Ni-vacancy clusters in bcc-Fe, the 10th International Conference on Computer Simulation of Radiation Effects in Solids, 19.-23.07.2010, Krakow, Poland.

**Al-Motasem, A. T.**, Posselt, M., Talati, M., Bergner, F. Thermodynamics of nanoclusters in bcc-Fe containing copper, nickel and vacancies, The 5<sup>th</sup> International Conference on Multiscale Materials Modeling (MMM-2010), 04.-08.10.2010, Friburg, Germany, 04.-08.10.2010, Freiburg, Germany.

Posselt, M., **Al-Motasem, A. T.**, Bergner, F., Birkenheuer, U. Atomistic study of copper-vacancy clusters in bcc-Fe, 5th Forum on New Materials, June 14-18, 2010, Montecatini Terme, Italy.

### **Posters at international conferences**

Posselt, M. and **Al-Motasem, A. T.**, Configurational Contribution to the free energy of embedded nanoclusters, COSIRES (2012 Computer Simulation of Radiation Effects in Solids), 24-29.06.2012, Santa Fe , United States.

Talati, M., Posselt, M., Bonny, G., **Al-Motasem, A. T.**, Bergner, F. Phonon contribution to the thermodynamics of pure and mixed clusters in bcc-Fe. DPG Frhjahrstagung, 13.-18.03.2011, Dresden, Germany.

Talati, M., Posselt, M., Bonny, G., **Al-Motasem, A. T.**, Bergner, F. Contribution of Lattice Vibrations to the Thermodynamics of Vacancy Clusters in bcc-Fe, The 5th International Conference on Multiscale Materials Modeling (MMM-2010), 04.-08.10.2010, Freiburg, Germany.

**Al-Motasem, A. T.**, Posselt, M., Bergner, F. Nucleation of copper-vacancy clusters in bcc-Fe: An atomistic study, Nuclear Materials 2010, An international conference in association with Journal of Nuclear Materials (NuMat2010), 04.-07.10.2010, Karlsruhe, Germany.

**Al-Motasem, A. T.**, Posselt, M., Bergner, F., Birkenheuer, U. Atomic-level computer simulations of copper-vacancy clusters in  $\alpha$ -Fe, First international

school on materials for nuclear reactors (MATRE-1), 18.-23.10.2009,  
Rochehaut-sur-Semois, Belgium.