

<b>Personal Details</b> <b>Family name, First name:</b> Khater, Hassan Ahmed <b>Researcher unique identifier:</b> <a href="http://orcid.org/0000-0002-0906-1825">http://orcid.org/0000-0002-0906-1825</a> <b>URL for web site:</b> <a href="http://www.aun.edu.eg/membercv.php?M_ID=386">http://www.aun.edu.eg/membercv.php?M_ID=386</a> <b>Date and Place of Birth:</b> April 26, 1973, Al- Menoufia, Egypt <b>Nationality:</b> Egyptian	
<b>Contact Information:</b> <b>Home:</b> Menoufia, Tala, Tablouha - 32618_ <u>Phone:</u> (+20) 224488688_ <u>Mobile:</u> (+20) 1093836171 (Preferable) <b>Work:</b> Department of Physics, Faculty of Science, Assiut University, 71516 Assiut, Egypt <u>Phone :</u> (+20) 88 2412253_ <u>Fax :</u> (+20) 88 2342708_ <u>E-mail:</u> <a href="mailto:h.khater@aun.edu.eg">h.khater@aun.edu.eg</a>	
<b>Languages</b> <b>Arabic:</b> Native <b>English:</b> Advanced <b>Spanish:</b> Basic	
<b>Education</b> <b>Doctor of Philosophy in Materials Science (Oct., 2004 - Dec., 2008),</b> <u>Thesis Title:</u> “Twin Boundaries and Other Defects in HCP Metals Studied By Computer Simulation”. <u>Place of Graduation:</u> Department of Engineering, Faculty of Science and Engineering, University of Liverpool, United Kingdom. <b>Master of Science in Experimental Physics “Spectroscopy” (Oct. 1998- Nov., 2002),</b> <u>Thesis Title:</u> “Structural, Electrical and Spectroscopic Studies Tetrachlorozincate $K_2ZnCl_4$ Single Crystals”. <u>Place of Graduation:</u> Physics Department, Faculty of Science, Assiut University, Egypt. <b>B. Sc. in Physics (Oct., 1991- Sep., 1995),</b> <u>Grade:</u> Very Good (Accumulative 80.1%) <u>Place of Graduation:</u> Faculty of Science, Menoufia University, Egypt.	
<b>Awards and Grants</b> <ul style="list-style-type: none"> <li>• The 2002 Prize of the Egyptian Atomic Energy Authority for youth researchers for the paper entitled “Gamma-Irradiation Induced Effects on Some of the Optical Parameters of KTZC Pure Crystals.”</li> <li>• Egyptian Government scholarship to study for Ph.D. in the UK in the field of Materials Modeling; 2004:2008.</li> <li>• Perform-60 Project research grant; Prediction of the Effects of Radiation for Reactor Pressure Vessels (RPV) and in-vessel Materials using Multiscale Modeling (60 years foreseen plant life time); 2009:11.</li> </ul>	
<b>Employment History</b> <b>1998- 2004:</b> Teaching assistant and Master student at Physics Department, Faculty of Science, Assiut University. <b>2004 - 2008:</b> Full time PhD Student at University of Liverpool, UK <b>2009 - 2009:</b> Lecturer of Physics at Faculty of Science, Assiut University, Egypt. <b>2009 - 2011:</b> Postdoctor, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain <b>2011-present:</b> Lecturer of Physics at Faculty of Science, Assiut University, Egypt. <b>2012-2013:</b> Part time Lecturer at the British University in Egypt, BUE, Faculty of Engineering, Department of Basic sciences.	

**Workshops and conferences**

Attended several international conferences and workshops on Material Science, Radiation and computational Physics.

- 1st Spring school on Current Activities of Materials Science - Assiut University, Egypt, April 2000.
- 2nd Spring school on Current Activities of Materials Science - Assiut University, Egypt, April 2001.
- The 2nd International Conference on Basic Sciences and Advanced Technology – BSAT- Assiut University, Egypt, Nov. 2001.
- The 6th Radiation Physics Conference -Assiut University, Egypt, Oct. 2002. (Oral presentation)
- The third International Conference on Multiscale Materials Modeling (MMM-2006) - The University of Freiburg, Germany, September 18-22, 2006. (Oral presentation)
- The XII International Conference on Intergranular and Interphase Boundaries in Materials (iib2007) – Barcelona, Spain, July 13-16, 2007. (Poster)
- Several committee meetings for the Perform-60 Project during 2010 and 2011 (Oral presentations)
- TMS Annual Meeting 2012- Orlando, Florida, USA – March 11-15, 2012 (Oral presentation).
- PRACE Autumn School 2012, "Massively Parallel Architectures & Molecular Simulations", 24-28 September 2012, Sofia, Bulgaria.

**Teaching Experience**

**All courses are instructed in English except those for faculty of education students.**

**1998 – 2004**

- **Assiut University - Egypt**

**(Labs)**

Heat, optics, Properties of Matter and Electricity.  
Solid State, Electronics and Modern Physics.

**2009 – 2015**  
**(undergraduate)**

General physics (heat, mechanics, electricity)  
Crystal Growth and Properties of Crystals.  
Electronics and Computational Physics,  
Lasers and its medical applications.

**2012 – 2013**  
**(Postgraduate)**

Computational Physics, Computer Programing for Physicists,  
Dislocations in Solids (Special topics)

**2015**  
**(Training)**

Training school teachers to instruct Science in English, Center of Public Service, Faculty of Education.

**2012 – 2013**

- **The British University in Egypt, BUE.**

Modern Physics for Chemical Engineers,  
Modern Physics for Mechanical Engineers,  
Modern Physics for Petroleum Engineers,

**2005 – 2007**

- **University of Liverpool – UK**

**(Labs)**

Hardness of Steel and Rheology of Rubber.

**Research Experiences**

- Growth of single crystals using the slow evaporation technique.
- X-ray diffraction using the powder technique.
- U.V. Spectrophotometry.
- Vacuum techniques.
- Electron Spin Resonance.
- Crystallography.
- Modeling defect and interaction structure in metals.
- Topological modeling of interface structures in polycrystalline materials.
- Computer simulations of polycrystalline structures.
- Mechanism of Shape Memory alloys and other analogue materials.
- Molecular Dynamics and Statics.
- Programming with FORTRAN, Python and Matlab. (order of competency)

**Research Interests**

I am interested in studying and understanding the atomic scale behavior of metals under severe conditions, such as radiation damage and temperature in nuclear power plants. Deformation in such materials is usually facilitated by the existence and interaction of crystal defects with each other or with an external shear. Additionally, I study martensitic transformations and the interface structure of polycrystalline Shape Memory Alloys. This class of materials can accommodate large strain by twinning and recover its original shape by heating. I am trying to investigate the memory mechanism of the magnetic Ni<sub>2</sub>MnGa alloy where the shape change is controlled by magnetic field.

In either case, I apply computer simulation, topological, elasticity and continuum theories to develop mechanistic models at different levels of physics and Engineering. My recent work in these directions includes deformation in zirconium in both low and high angle grain boundary regimes; modeling the dynamics of edge and screw dislocation in both zirconium and carbon steel.

Plans for future work include studying martensitic transformations and the interface structure of polycrystalline Shape Memory Alloys. This class of materials can accommodate large strain by twinning and recover its original shape by heating. I am eager to investigate the memory mechanism of the magnetic NiMnGa alloy where the shape change is controlled by magnetic field.

**Publications**

1. Gamma-Irradiation Induced Effects on Some of the Optical Parameters of KTZC Pure Crystals. M.A. Hefni, A. Abu El-Fadl, and H.A. Khater, Arab. J. Nucl. Sci. Appl. 36, 707-713 (2003).
2. Changes in Optical Parameters of Potassium Tetrachlorozincate (KTZC) Single Crystals under Doping and Irradiation Conditions. A. Abu El-Fadl, M.A. Hefni and H.A. Khater, Arab. J. Nucl. Sci. Appl. 36, 852-859 (2003).
3. Modelling Investigation of Interfacial Disconnection Mechanisms. H.A. Khater, A. Serra, D. J. Bacon and R. C. Pond. Proceedings of the MMM 2006 Conference, 18-22 sep., 2006, Freiburg, Germany, 465-468
4. Dislocation core structure and dynamics in two atomic models of  $\alpha$ -zirconium. H.A. Khater and D.J. Bacon, Acta Mater. 58, 2978–2987 (2010).
5. Interaction of carbon with vacancy and self-interstitial atom clusters in  $\alpha$ -iron studied using metallic- covalent interatomic potential. Dmitry Terentyev, Napoleón Anento, Anna Serra, Ville Jansson, Hassan Khater, Giovanni Bonny, J. Nuclear Materials. 408, 272–284 (2011).
6. The disconnection mechanism of coupled migration and shear at grain boundaries. H.A. Khater, A. Serra, R.C. Pond and J.P. Hirth, Acta Mater. 60, 2007–2020 (2012).
7. Atomic shearing and shuffling accompanying the motion of twinning disconnections in Zirconium. H.A. Khater, A. Serra and R.C. Pond, Philosophical Magazine. 93, 1279-1298 (2013).
8. Disconnection Motion in Low- and High-Angle Symmetrical Tilt Grain Boundaries in HCP Metal. Robert C. Pond, John P. Hirth, Hassan A. Khater and Anna Serra. Materials Science Forum Vol. 753 (2013) pp 125-130.
9. Twin Boundary Mobility, R. C. Pond, H. A. Khater and A. Serra International Conference on Ferro-Magnetic Shape-Memory Alloys (ICFSMA) in Boise, Idaho in June 2013.
10. Interaction of edge dislocation with single and 400ppm interstitial carbon atoms in  $\alpha$ -Fe H. A. Khater, G. Monnet, D. Terentyev and A. Serra, International Journal of Plasticity 62 34–49 (2014).