CURRICULUM VITAE

SHARHABEEL ALYONES

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Current Position

Associate Professor, The Hashemite University**,** Physics Department, Zarqa 13115 Jordan

EDUCATION

DEGREE	Specialization	INSTITUTION	YEAR
PhD	Material Physics (Electromagnetic Scattering by Small Particles) Theoretical and experimental	New Mexico State University, USA	2000 – 2006
MSEE	Electrical Engineering (Photonics)	New Mexico State University, USA	2003 – 2005
MSc	Physics (Magnetic Properties of Magnetic Fluids) Theoretical	Yarmouk University, Jordan	1995 – 1998
BSc	Physics	Yarmouk University, Jordan	1990 – 1994

* PhD Dissertation Title: Electromagnetic scattering and Absorption by a finite conducting thin fiber
* PhD Dissertation Advisor: Prof. Charles W. Bruce (**cbruce@nmsu.edu**)

** MSc Dissertation Title: Numerical Calculations of the Entropy and Magnetization of Magnetic Fluids with Chain Aggregates.
** MSc Dissertation Advisor: Prof. I. Abu-Aljarayesh (**ljaraysh@yu.edu.jo**)

ACADEMIC EXPERIENCE

2012 - 2014	Visiting Associate Professor, Department of Physics, New Mexico State University, USA
2012	Associate Professor, Department of Physics, The Hashemite university, Jordan
2006 – 2012	Assistant Professor, Department of Physics, The Hashemite University, Jordan
1994 – 1999	Instructor of Physics, Ministry of Education, Jordan

RESEARCH EXPERIENCE

Date	Position	Place of Work
2012- 2014	Visiting Research Associate Professor	Department of Physics, New Mexico State University, USA
Summer of 2011	Visiting Research Scientist	Department of Physics, New Mexico State University, USA
Summer and fall of 2010	Visiting Research Scientist	Department of Physics, New Mexico State University, USA
Summers of 2009	Visiting Research Scientist	Department of Physics, New Mexico State University, USA
Summer of 2008	Visiting Research Scientist	Department of Physics, New Mexico State University, USA
Summer of 2007	Visiting Research Scientist	Department of Physics, New Mexico State University, USA
2000 – 2006	Research Assistant	Department of Physics, New Mexico State University, USA

COURSES TAUGHT AT NEW MEXICO STATE UNIVERSITY (USA) (FALL 2013)

Phys 215G, Engineering Physics (I)
Phys 216G Engineering Physics (II)

COURSES TAUGHT AT THE HASHEMITE UNIVERSITY (JORDAN)

1. **Undergraduate**
   Phys 101, General Physics (I)
   Phys 102 General Physics (II) (coordinator of 10 sections)
   Phys 203 General Physics (III)
   Phys 322, Vibrations and Waves
   Phys 331, Electromagnetism (I)
   Phys 332, Electromagnetism (II)
   Phys 321, Physical Optics
   Phys 312, Advanced Physics Lab

2. **Graduate**
   Phys 731, Electrodynamics (Graduate)
   Phys 741, Statistical and Thermal Physics (Graduate)
   Phys 751, Classical Mechanic (graduate)

RESEARCH INTEREST

Electromagnetic scattering by small particles

Production of artificial small particles with optimum extinction efficiencies (absorption or scattering) has been interested for electromagnetic shielding applications. The parameters controlled in this process are the shape, size and material contents (complex index of refraction) of such particles, fibers and discs with multilayer constructions are candidates for this process. Long and short wavelength regions are involved in this research.

a) Fiber Shape particles
Electromagnetic scattering by small particles with specific shapes (fibers, discs, etc.) has recently elicited interest over the long and short wavelengths spectral regions. These particles can be used for electromagnetic shielding when manufactured with specific geometry and material contents. I studied the electromagnetic response by fiber like particles numerically and experimentally. I have produced an efficient numerical code which calculates the scattering and absorption cross section using two different numerical approaches (Alyones Code). Research is still active at New Mexico state university to produce high efficient fiber like particles in the visible and infrared for electromagnetic shielding application. This research is funded by the Edgewood Chemical and Biological Center, U. S. Army.

b) Disc Shape particles
I am studying the electromagnetic response of disc shape particles numerically and experimentally in collaboration with Prof. Charles Bruce, NMSU. The existing numerical solutions tend to be not working for all disc parameters (size, aspect ratio and index of refraction). This research is funded by the Edgewood Chemical and Biological Center, U. S. Army.

Metamaterials
Currently, I am performing research on designing band pass and band stop filters based on negative index metamaterials, At the same time, I am participating in the research effort to produce highly efficient small particles for electromagnetic shielding applications.

Previous Research:
I have studied numerically the magneto caloric effect in magnetic fluids and the effect of chain aggregates on entropy and magnetization

EXPERTISE AND SKILLS

1. Professional Fortran Language Programmer. I have wrote several electromagnetic codes based on the moment method for the calculations of electromagnetic scattering and absorption by fiber shape particles (straight fibers, L-Shape and curved fibers)
2. Knowledge of Various Numerical Techniques in Electrodynamics (Finite difference time domain method, finite element method, Moment Method, T-matrix Method…..)
3. Good Experimental Experience (Magnetism, Electronics, Optics)
4. Good Background in Machining.
5. Knowledge of Using the Electro Optical System Design Software Zeemax.
6. Knowledge of Using the Electromagnetic Softwares: CST Microwave studio, HFSS, and Comsol multiphysics.
7. Good Background in Digital Design and signal processing techniques.
8. Programming using Mathcad and Matlab Softwares.
9. Using the Vibrating System Magnetometer (VSM)
10. Optical Spectroscopy and Photo acoustic techniques.
11. X-ray (EDS)
12. SEM, TEM Microscopy (Trained at New Mexico State university while performing experimental research on micro and nanofibers)

PROFESSIONAL MEMBERSHIP:

American Physical Society (APS)
Jordanian SESAME Material science RESEARCH group since 2006

HONORS, AWARDS AND SCHOLARSHIPS

1. Graduate school research assistant award for best researcher, New Mexico state university. (2005)
2. Undergraduate scholarship, ministry of education (Jordan). (1990-1994)
3. Graduate scholarship, The Hashemite University (Jordan). (2001-2004)

GRANTS

1. 2010, Electromagnetic scattering and absorption by disc shape particles. The Hashemite University, Zarqa, Jordan.

2. 2010, Electronic and magnetic properties of strongly correlated electron systems in uranium, cerium, and other rare-earth compound probed with vibrating system magneto meters. The Hashemite university, Zarqa, Jordan

3. 2008, Correlations between lattice, exchange and 5*f*-ligand hybridization in uranium compounds. The Hashemite University, Zarqa, Jordan.

4. 2007, Electromagnetic scattering and absorption by L-shape fibers. The Hashemite University, Zarqa, Jordan.

INSTITUTIONAL AND PROFESSIONAL SERVICE IN LAST FIVE YEARS

1. Graduate Committee Activities: Masters Committees:
   a) Co-advisor of Mahmooud Alzayat, MSc thesis title: Exchange bias field variations in NiFe/FeMn/ NiFe trilayers as a function of seed layer thickness, the Hashemite university, December 2008.
   b) Member of graduate examinee committee: Hiyam Al-Khason, title: Study of neutral many bosonic systems in static fluctuation approximation with a potential model close to a real model, MSc thesis, the Hashemite University, May 2008.
   c) Member of graduate examinee committee: Ahmad Ali, title: Phtophysical Properties of Pyropheophorbide Derivatives Photosentizer for cancer Treatment, MSc thesis, the Hashemite University, Feb 2008.
2. Several Department and Faculty Committees

3. Reviewer for Progress in electromagnetic research Journals of the electromagnetic academy, USA
4. Reviewer for the Journal Of electromagnetic Waves and Application, USA

CONFERENCE ATTENDANCE

1. Condensed matter physics conference at Yarmouk University, Jordan 1999.
2. Santa Fe nanotechnology conference, Oct 2-Oct7 2005, Santa Fe, NM USA
3. APS march meeting 2007, Denver, CO, USA
4. Organizer of a session and presenter of two papers in Progress in electromagnetic research symposium 2008, Cambridge, MIT 2008, USA

PUBLICATIONS

1. ***S. Alyones***, A. V. Jelinek, M. Granado, and C. W. Bruce***,*** " Design of Metaparticles as Sharp Frequency-Selective Obscurant Aerosols," *Progress In Electromagnetics Research M*, Vol. 30, 141-152, 2013.
2. C. W. Bruce, and ***S. Alyones,*** " Visible and infrared optical properties of stacked cone graphitic microtubes," Appl. Opt, Vol. 51, No. 16, June 2012.

3. ***S. Alyones,*** and C. W. Bruce, "Curved fiber scattering," Progress In Electromagnetics Research M (*PIER M*), Vol. 17, 225-236, (2011).

4. ***S. Alyones,*** and C. W. Bruce, " Electromagnetic scattering by finite conducting fiber: Limitation of a previous published code," Journal Of Electromagnetic Waves And Applications (*JEMWA*),Vol. 25, N. 7, 1021-1030, (2011).

5. C. W. Bruce, and ***S. Alyones***, " Extinction efficiencies for metallic fibers in the infrared," Appl. Opt., Vol. 48, 5095-5098, (2009).

6. A. M. Alsmadi, ***S. Alyones***, C. H. Mielke, R. D. McDonald, V. Zapf, M. M. Altarawneh, A. Lacerda, S. Chang, S. Adak, K. Kothapalli, and H. Nakotte, "Radio-frequency measurements of UNiX compounds (X =Al, Ga, Ge) in high magnetic fields," J. Magn. Magn. Mater. Vol. 321, 3712-3718 (2009).

7. A. M. Alsmadi, ***S. Alyones***, C. H. Mielke, R. D. McDonald, V. Zapf, M. M. Altrawneh ,A. Lacerda, S. Chang, S. Adak, K. Kothapalli, and H. Nakotte, "Complex conductivity of UTX compounds in high magnetic fields," J. Appl. Phys. Vol. 105, 07E108 (2009).

8. ***S. Alyones,*** M. S. Bawa'aneh, A. M. Alsmadi, and C. W. Bruce, "Numerical solution for the problem of electromagnetic scattering by a thin finite conducting L-shape fiber," Journal Of Electromagnetic Waves And Applications (*JEMWA*),Vol. 22, 2485-2495, (2008).

9. M. S. Bawa'aneh, H. M. El-nasser, G. Assyed, ***S. Alyones***, A. M. Alsmadi, S. Al-awfi, and M. Al-sughayer, "Stimulated Raman scattering of extraordinary electromagnetic waves in weakly magnetized plasma," PIERS Proceedings, Cambridge, USA, July 2-6, (2008)***.***

10. ***S. Alyones,*** C. W. Bruce, and A. K. Buin "Numerical methods for solving the problem of electromagnetic scattering by a finite thin conducting fiber," IEEE Trans. Antennas. Propag.,Vol. 55, 1856-1861, (2007).

11. C. W. Bruce, A. V. Jelinek, S. Wu, ***S. Alyones***, and Q. S. Wang " Millimeter-Wavelength investigation of fibrous aerosol absorption and scattering properties," Appl. Opt., Vol. 43, 6648-6655, (2004).

12. C. W. Bruce, A. V. Jelinek, ***S. Alyones***, A. K. Buin, and P. Takmakov " Providing the basis for optimal obscurant design," Obscurants 2005, June 6-9, Orlando, Florida.

13. I. Abu-Eljarayesh, and ***Sh. Migdadi(Alyones)***, "Numerical calculation of the entropy and magnetization of magnetic fluids with chain aggregates," J. Magn. Magn. Mater., Vol. 191, 174-180, (1999).

14. Charles W. Bruce, A. V. Jelinek, Sheng Wu, **Sharhabeel Alyones**, and Qingsong Wang., " Investigation of Fiberous Aerosol Absorption and Scattering Properties: A search for optimal Yield Aerosols, contract No. DAAM01- 98-0014, for Edgewood Chemical and Biological Center, Feb. 2004.

15. Charles W. Bruce, Sharhabeel Alyones and Al V. Jelinek., "Optimum Broad Spectrum Obscurants for the Visible and Infrared," Contract No. DAAD13-02-C-0009 For Edgewood Chemical and Biological Center, Feb. 2006.

REFERENCES

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