

CURRICULUM VITA

CV



PERSONAL DATA

Full Name:	Eqab Mahmoud Mohammad Rabei
Date and Place of Birth:	May 7, 1963, Rimoon
Nationality:	Jordanian
Permanent Address:	Department of Physics, Al al Bayt University, P.O.Box130040, Mafraq-Jordan . FAX:(962-6) 6297000/ext 2165 eqabrabei@gmail.com
Home Address:	Rimoon, Jarash—Jordan Mobile: (962) 779932558
Marital Status:	Married, Four daughters and two sons
Profession:	Professor of Mathematical Physics

Academic Qualification

1. Doctor of Philosophy (Ph.D in Physics), Middle East Technical University (METU),
Mathematical Physics 1992.
Thesis Title: "**AN INVESTIGATION OF THE HAMILTONIAN FORMULATION OF SINGULAR SYSTEMS**".
2. Master of Science (M.SC. in Physics), Middle East Technical University (METU),
Mathematical Physics 1988.
Thesis Title: "**A REVIEW OF CONSTRAINED SYSTEMS**".
3. Bachelor of Science (B.Sc. in Physics), Yarmouk University, Irbid, 1986.

Research Interest

1. The Hamiltonian and the Lagrangian approaches for constrained systems.
2. Hamilton-Jacobi treatment and quantization of constrained systems.
3. Mathematical Physics and High Energy Physics.
4. Quantum Geometric Phases and Bargmann Invariants.
5. Fractional Calculus and its Physical Applications.

Publications in Reviewed Journals

1. **Eqab M. Rabei**, A. Al-Jamel, H. Widyan, and D. Baleanu, Comment on: Maxwell's Equations and Electromagnetic Lagrangian Density in Fractional Form, *Journal of Mathematical Physics*, (2014), 55, 034101; doi: 10.1063/1.4868479.
2. Ahmed Al-Jamel, Hatem Widyan and **Eqab M. Rabei**, The Octupole Field Effect on the H Atom Spectrum in Noncommutative Space, *Advanced Studies in Theoretical Physics*, Vol. 6, no 18, 887-892,(2012).
3. Dumitru Baleanu, Sami Muslih, **Eqab M. Rabei**, Alireza K. Golmankhaneh, and Ali K. Golmankhaneh, On Fractional Hamiltonian Systems Possessing First-Class Constraints within Caputo Derivatives, *Romanian Reports in Physics*, Vol. 63, No. 1, P. 3-8,(2011).
4. Nadeen Hayk, Ahmed Al-Jamel, **Eqab M. Rabei**, The Fractional model for Damping in Oscillatory systems, *Proceeding of the 3rd(2011)CUTSE International Conference*, Miri, Sarawak, Malaysia, 8-9 Nov., (2011).
5. Madhat Sadallah, Sami Muslih, Dumitru Baleanu and **Eqab M. Rabei**, Fractional Time Action and Perturbed Gravity, *Fractals*, Vol. 19, No. 2, 243-247, (2011).
6. N. Chair, A. Al-Jamel, M. Sarhan, M. Abu Sini, and **Eqab M. Rabei** The Noncommutative quadrupole field effect for the H-atom, *Journal of physics A, Math. Theor.* 44, pp1-6,(2011).
7. **Eqab M. Rabei**, Ibrahim M. Rawashdeh, Sami I. Musleh, Dumitru Baleanu, Hamilton-Jacobi Formulation for Systems in Terms of Riesz's Fractional Derivatives. *International Journal of Theoretical Physics*, Vol. 50, 1569-1576,(2011).
8. Mohamad A. E. Herzallah, Sami I. Muslih, Dumitru and **Eqab M. Rabei**, Hamilton-Jacobi and Fractional Like Action with Time Scaling, *Nonlinear Dynamics* Accepted for publication.
9. Sami I. Musleh, Madhat Saddallah, Dumitru Baleanu, and **Eqab M. Rabei**, Lagrangian Formulation of Maxwell's Field in Fractional D dimensional Space-Time, *Romanian Journal of Physics*. Accepted paper
10. R. Eid, Sami I. Musleh, Dumitru Baleanu, and **Eqab M. Rabei**, Fractional Dimensional Harmonic Oscillator, *Romanian Journal of Physics*, Vol. 56, 323-331, 2011.
11. Khaldoun M. Tarawneh, **Eqab M. Rabei**, and Humam B. Ghassib, Lagrangian and Hamiltonian Formulations of the Damped Harmonic Oscillator Using Caputo Fractional Derivative, *Journal of Dynamical Systems and Geometric Theories*. Vol. 8, No 1, 59-70, May (2010).
12. M. Serhan, M. Abusini, **Eqab M. Rabei**, Quantization of Holonomic Systems Using WKB Approximation, *International Journal of Theoretical Physics*, vol. 48: 2731-2739.(2009)

13. Eqab M. Rabei , Ibrahim M. A. Altarazi, Sami I Musleh and Dumitru Baleanu, Fractional WKB Approximation, Nonlinear Dynamics, vol. 57: 171-175, (2009).
14. R. Eid, Sami I. Musleh, Dumitru Baleanu, and Eqab M. Rabei , On Fractional Schrodinger Equation in Alpha-Dimensional Fractional Space, Nonlinear Analysis Series B: Real World Applications, 10, pp. 1299-1304,(2009) .
15. Eqab M. Rabei and Bashar S. Ababneh, Hamilton-Jacobi Fractional Mechanics, Journal of Mathematical Analysis and Applications, 344, 799-805, (2008).
16.Sami I. Muslih, Dumitru Baleanu and Eqab M. Rabei , Solutions of Massless Conformal Scalar Field in an n-Dimensional Einstein Space, Acta Physica Polonica Vol. 39,No. 4,(2008).
17. Eqab M. Rabei , Sami I Musleh and Dumitru Baleanu, Quantization of Fractional Systems Using WKB Approximation, Communications in Nonlinear Science and Numerical Simulations, Accepted for publication
18. Sami I. Musleh, Dumitru Baleanu, and Eqab M. Rabei , Hamiltonian Formulation for Continuous Systems with Second Order Derivatives, International Journal of Theoretical Physics, Vol. 47, 2195-2202, (2008).
19. Eqab M. Rabei , Ibtesam Almayteh, Sami I. Muslih and Dumitru Baleanu, Hamilton-Jacobi Formulation of Systems within Caputo's Fractional Derivative, Physica Scripta, Vol. 77, 1-6, (2008).
20. Sami I. Musleh, Dumitru Baleanu, and Eqab M. Rabei , Fractional Hamilton's Equations of Motion in Fractional time, Central European Journal of Physics, Vol. 5, No. 4, 549-557,(2007).
21. Sami I. Musleh, Dumitru Baleanu, and Eqab M. Rabei , Gravitational Potential in Fractional Space, Central European Journal of Physics, Vol. 5, No. 3, 285-292, (2007).
22. Eqab M. Rabei , Derar M. Tarawneh, Sami I. Musleh, and Dumitru Baleanu, Heisenberg's Equations of Motion with Fractional Derivatives, Journal Vibration And Control, vol.13, pp. 1239-1247, (2007).
23. Dumitru Baleanu, Sami I. Musleh and Eqab M. Rabei , On Fractional Euler- Lagrange and Hamilton Equations and The Fractional Generalized of Total Time Derivative, Nonlinear Dynamics, 53, 67-74, (2007).
24. Eqab M. Rabei and Moaz M. Tarawneh, The Quantization of Higher Order Regular Lagrangians as First Order Singular Lagrangians, International Journal of Theoretical Physics, Vol. 46, no. 4 April, 884-897, (2007).
25. Eqab M. Rabei , Khaled I. Nawafleh, Raed S Hijjawi, Sami I Musleh and Dumitru Baleanu, The Hamilton Formalism With Fractional Derivatives, Journal of Mathematical Analysis and Applications, Vol 327, Issue 2, 891-897, (2007).
26 Sami I. Muslih, Eqab M. Rabei , and Dumitru Baleanu, Proceedings of the 2nd IFAC Workshop on Fractional Differentiation and its Applications, Porto, Portugal, July 19-21, 148-151, (2006).
27 Eqab M. Rabei , Abdul-Wali Ajlouni, and Humam B. Ghassib, quantization with Fractional Calculus,Proceedings of the 9 th WSEAS International Conference on Applied Mathematics, Istanbul, Turkey, May 27-29, pp256-262,(2006).
28. Eqab M. Rabei , Abdul-Wali Ajlouni, and Humam B. Ghassib, Quantization of Non-conservative Systems Using Fractional Calculus, WSEAS Transaction on Mathematics, Issue 7, Vol. 5,853,(2006).
29. Sami I. Musleh, D. Baleanu and Eqab M. Rabei , Hamiltonian Formulation of Classical Fields with Riemann-Liouville Fractional Derivatives, Physica Scripta, Vol. 73, 436-483,(2006).
30. Eqab M. Rabei , Abdul-Wali Ajlouni, and Humam B. Gassib, Quantization of Brownian

Motion, International journal of Theoretical physics, Vol.45, 1619-1629, (2006).
31 Sami I. Musleh, Eqab M. Rabei , Quantization of Mechanical Systems with Fractional Derivatives, Modern Physics Letters A, Vol. 20, No. 27, 2095, (2005).
32 Sami I. Musleh, Hosam A. El-Zalan and Eqab M. Rabei , Hamilton-Jacobi Quantization of Singular Lagrangians with Linear Velocities, International Journal of Theoretical Physics, Vol. 44, No 8, 1271, (2005).
33 Eqab M. Rabei , Eyad H. Hassan, and Humam B. Ghassib, Quantization of Second-Order Constrained Lagrangians Systems Using the WKB Approximation, International Journal of Geometric Methods in Modern Physics, Vol. 2, No. 3, 485-504, (2005).
34 Eqab M. Rabei , Eyad H. Hassan, and Humam B. Ghassib, quantization of Higher-Order Constrained Lagrangian Systems Using the WKB Approximation, International Journal of Theoretical Physics, Vol. 43, No. 11, 2285, (2004).
35 Eqab M. Rabei , Tareq S. Alhalholy, and A. A. Taani, On Hamiltonian Formulation of Non-Conservative Systems, Turkish Journal of Physics, Vol. 28, 213, (2004).
36 Eqab M. Rabei , Eyad H. Hassan, and Humam B. Ghassib, Hamilton-Jacobi Treatment of Constrained Systems with Second-Order Lagrangians, International Journal of Theoretical Physics, Vol. 43, No. 4, 1073, (2004).
37 Eqab M. Rabei , T. S. Alhalholy, and Akram A. Rousan, Potentials of Arbitrary Forces with fractional Derivatives, International Journal of Modern Physics A, Vol. 19, 3083, (2004).
38 Eqab M. Rabei , Khaled I. Nawafleh, and Humam B. Ghassib, The Motion of a Spinning Particle in an External Electromagnetic Field as a Constrained System, Journal of Dynamical Systems and Geometric Theories, vol. 2, 1, (2004).
39 Khaled I. Nawafleh, Eqab M. Rabei , Humam B. Ghassib, Hamilton-Jacobi Treatment of Constrained Systems, International Journal of Modern Physics A, Vol. 19, No 3, 347, (2004).
40 Eqab M. Rabei , Khaled I. Nawafleh, and Humam B. Ghassib, Quantization of Reparameterized Systems Using the WKB Method, Tur. J. Phys, 29, 1, (2003).
41 Eqab M. Rabei , Quantization of Christ-Lee Model Using the WKB Approximation, International Journal of Theoretical Physics, Vol. 42, No. 9, 2097, (2003).
42 Eqab M. Rabei , Khaled I. Nawafleh, Yacoub S. Abdelrahman, and H. Y. Rashed Omari, Hamilton-Jacobi Treatment of Lagrangians with Linear Velocities, Modern Physics Letters A, Vol. 18, No. 23, 1591, (2003).
43 Hussain Y. Rashed Omari, and Eqab M. Rabei , Off-axis Large Time Scale Polarization of polar stars, Indian Journal of Radio and Space Physics, Vol. 31, (2002).
44 Hussain Y. Rashed Omari, and Eqab M. Rabei , On-axis Large Time Scale Polarization of AM-Her Stars, Abhath Al-Yarmouk Journal, Vol. 11, 287, (2002).
45 Akram A. Rousan, Ehab Malkawi, Eqab M. Rabei , Hatem Widyan, Application of Fractional Calculus to Gravity, Fractional Calculus & Applied Analysis, vol. 5, 155, (2002).
46 Eqab M. Rabei , Khaled I. Nawafleh, and Humam B. Ghassib, Quantization of Constrained Systems Using the WKB Approximation, physical review A., vol. 66, 024101, (2002).
47 Eqab M. Rabei , Hatem Widyan, and Ehab Malkawi, Treating Quantum Chromodynamics as Constrained System, Hadronic Journal, Vol. 24, 507, (2001).
48 Eqab M. Rabei , Khaled M. AL-Khaled and Humam B. Ghassib, the Path-Integral Approach for Constrained Systems in its Lagrangian Form, Hadronic Journal Supplement, Vol. 15, n. 2, 211, (2000).
49 Eqab M. Rabei , On the Quantization of Constrained Systems Using Path-integral Approach, Il Nuovo Cimento, vol. 115B, N. 10, 1159, (2000).

50	Eqab M. Rabei , and Hussain Y. Rashed Omari, The Treatment of Holonomic Systems as Singular Systems Using the Dirac method, Mutah Lil-Buhooth Wa Al-Dirasat, (Natural and Applied Sciences) vol.15, No.1,83, (2000).
51.	Eqab M. Rabei , Arvind, R. Simon and N. Mukunda, Bergmann Invariants and Geometric Phases-A Generalized Connection. Phys. Rev. A Vol.. 60, n.5, 3397 –3409, (1999).
52	Eqab M. Rabei , KhaledI. Nawafleh, and Humam B. Ghassib, Some Physical Applications of the Canonical Method, Hadronic Journal, Vol.22, 241, (1999).
53	Eqab M. Rabei , Canonical Treatment of Regular Lagrangian with Holonomic Constraints as Singular Systems, AMS/IP Studies in Advanced Mathematics, Vol.13, 441, (1999).
54.	Eqab M. Rabei , An Investigation of singular Lagrangians as field systems, II Nuovo Cimento, vol. 112B, issue 11, November 1447,(1997).
55	Eqab M. Rabei and Salam Tawfiq, Hamilton-Jacobi Treatment of QED and Yang-Mills Theory as Constrained Systems, Hadronic Journal, Vol. 20, 232 (1997).
56	Eqab M. Rabei , Hamilton-Jacobi Partial Differential Equations of Singular Systems, Journal of the Physical Society of Japan. vol.66 No .4, 995,(1997).
57	Eqab M. Rabei , On Hamiltonian Systems with Constraints, Hadronic Journal, vol. 19, 597, (1996).
58	Eqab M. Rabei and Y. Guler, An Investigation of the Dirac Conjecture on Constrained Systems, II Nuovo Cimento, vol. 110B, 893, (1995).
59	Eqab M. Rabei , On the Lagrangian Formulations of Singular Systems, Tr. J. of Physics, Vol. 19, 1580, (1995).
60	Eqab m. Rabei and Y. Guler, A Treatment of Electromagnetic Theory as a Singular system, II Nuovo Cimento, vol. 109B, 341,(1994).
61	Eqab M. Rabei and Y. Guler, An Investigation of a Singular System, Tr. J. of Physics vol. 16, 297, (1992).
62	Eqab M. Rabei and Y. Guler, The Hamilton-Jacobi Treatment of Second Class Constraints, Phys. Rev. A, vol.. 46,3513, (1992).

Published Books (in Arabic)

Introduction to Lagrangian and Hamiltonian Mechanics, Mu'tah University, (1998).

Conferences Attended

1. The Second Jordanian Mathematics Conference at Mutah University, Jordan, 11-14 sept.,1994

2. Mechanics First Maghrebin congress at Ghardaia, Algerie, March 23-26,1996

3. Trends in Mathematical Physics at the University of Tennessee, Knoxville, October 14-17, 1998.	October
4. The 32nd Symposium on Mathematical Physics, Torun, Poland, June 6-10, 2000 5. Sixth Petra School of Physics 6-13 September 1998.	
5. The First Conference on Medical Physics and its Applications, Zarka private University, Jordan 24th-26th April 2000.	
6. Third Science Day. Jordan University of Science and Technology. May, 23, 2000	
7. Mu'tah Mathematical Workshop, Tuesday 29th, February 2000.	
8. Seventh Petra School of Physics, 17-22 September 2000.	
9. Summer School and Workshop, Dirac Operators: Yesterday and Today, August 27-September 7, 2001, Center for Advanced Mathematical Sciences, AUB-Beirut-Lebanon.	
10. The International Conference Mathematics, Nuclear Physics and Application, Cairo, Egypt, 8-13 March, 2003.	
11. International Workshop on Global Analysis, Cankaya University, Ankara – Turkey, April 15-17, 2004,	
12. Sixth International Conference On Symmetry in Nonlinear Mathematical Physics, June 20-26, 2005, Kyiv, Ukraine.	
13. Mathematical Methods in Engineering International Symposium, Cankaya University, Ankara-Turkey, 27-29 April 2006.	
14. 9th WSEAS Int. Conf. on Applied Mathematics, Istanbul, Turkey, May 27-29, 2006.	
15. Second IFAC Workshop on Fractional Differentiation and its Applications, 19-21 July, 2006, Porto, Portugal.	
16. The Ninth International conference on Geometry, Integrability, and Quantization, June 8-13, 2007, Varna, Bulgaria.	
17. 3 rd IFAC Workshop on Fractional Calculus and Its Applications, Ankara, Turkey, 05-07 November, 2008	
18. Asian Mathematical Conference AMC2009, Universiti Sains Malaysia, Kuala Lumpur Malaysia 22-26, June, 2009.	
19. International Conference on Analysis and Applications, Sultan Qaboos University, Muscat Oman, January 24-26, 2010.	
20. AQT- Advances in Quantum Theory, International Centre for Mathematical Modelling in Physics, Engineering and Cognitive Sciences, Linnaeus University, Sweden, June 14-17, 2010.	
21. The 4 th IFAC Workshop on Fractional Differentiation and Its Applications, Badajoz (Spain), 18-20, October, 2010.	

22. 3rd CUTSE International Conference, Curtin University, Engineering and Science On 8-9 November 2011, Sarawak Malaysia.

23. The Fifth Symposium on Fractional Differentiation and its Applications, May 14-17, (2012), Hohi University, Nanjing, China.

Scientific Visits

1. Visit to Middle East Technical University for a period of one month. 1993

2. Visiting Fellowship at the international center for Theoretical Physics for a period of three months in 1995.

3. Fellowship by the Third World Academy of Sciences, (ICTP) Trieste, to visit the Jawaharlal Nehru Centre for Advanced Scientific Research, Indian institute of Science, Bangalore, India, for a period of two months. (1998)

Awards

1. The 1999 Third world Academy of Sciences (TWAS) Prize.

2. Prize of Prof. Ehab the late general secretary of the Arab Universities Union

3. Abdul Hameed Shoman Prize (2003)

Committees

1. Member of Scientific research committee.

2. Member of preparatory committee, First Conference on Material Science, Mutah University.

3. Head of the graduate studies committee.

4. Member of Science Faculty Council./ Mutah Univ.

5. Member of graduate studies council.

6. Acted as External Examiner on M.Sc. and Ph. D. Committees

7. Participated in a number of Seminars.

8. Member of Trustees Board of Jarash University 2001- Now

9. Member of American Mathematical Society.

10. Associate membership, Center for Advanced Mathematical Sciences, American University of Beirut.

11. Member of scientific advisory committee.

12. Member of University Council/ Al al-Bayt University

13. Member of Science Faculty council / Al-alBayt univ.

14. Accreditation Committee for Science and Engineering/ Ministry of Higher Education 2007-2009.

15. members of the scientific committee of the International Conference on Materials in

Jordan, Humboldt Kolleg, 9-11 April 2011, German-Jordan University, Amman, Jordan
16. members of the scientific research support fund committee/ Ministry of Higher Education. 2011-2013
17. Chairman of the Committee for the Basic Sciences sectorial/ scientific research support fund / Ministry of Higher Education. 2012-2013
18. Chairman of organizing committee of International Conference on Sciences 2012 (Al al-Bayt University and Universiti Kebangsaan Malaysia)
19. Head of Science Faculty council / Al-alBayt univ.
20. Head of graduate studies council/ Al-alBayt univ.

REVIEWER IN

1. Journal of Mathematical Physics (published by American Institute of Physics)
2. Mathematical Methods in Applied Sciences
3. The IOP (Institute of Physics, England) Journals.
4. IL Nuovo Cimento B.
5. The International Journal of Theoretical Physics
7. Abstract and Applied Analysis
8. Journal of Vibration and Control
9. Advances in Mathematical Physics
10. Nonlinear Dynamics (NODY)

SUPERVISORY

Title	Degree	Institution	Year
Constrained Hamiltonian Systems	M.Sc.	JordanUniversity	1998
Quantization of Constrained Systems	M.Sc.	JordanUniversity	1999
Lagrangian and Hamiltonian Formulation with Fractional Derivatives.	M.Sc.	MutahUniversity	2003
Hamiltonian Formulation of Higher-order Lagrangians	M.Sc.	MutahUniversity	2003
Some Physical Applications of Fractional Calculus	M.Sc.	MutahUniversity	2004

The Treatment of Regular Higher-Order Lagrangian as Singular First Order Lagrangian	M. Sc.	MutahUniversity	2004
The Path-Integral Quantization for the Non-Conservative Systems	M. Sc.	MutahUniversity	2006
Generalized Hamilton-Jacobi Partial Differential Equation	M. Sc.	MutahUniversity	2007
Quantization using Fractional WKB Approximation	M. Sc.	MutahUniversity	2007
Quantization of Constrained Systems Using the WKB Approximation	Ph.D.	JordanUniversity	2001
Quantization of Higher-Order Constrained Lagrangian Systems Using the WKB Approximation	Ph.D.	JordanUniversity	2004
Quantization of Non-Conservative systems Using Fractional Calculus	Ph.D.	JordanUniversity	2004
Hamiltonian Formulation of Damped Harmonic Oscillator	Ph. D.	JordanUniversity	2008
Quantization of the Fractional Harmonic Oscillator in Terms Of Riesz Fractional Derivatives	M. Sc.	Al Al-Bayt University	2010
Treatment of Damped Harmonic Oscillator Using Fractional Calculus	M. Sc.	Al Al-Bayt University	2010

Citations

Identified by Elsevier as the top cited article 2005-2010 Awarded to: Rabei, Eqab M., Nawafleh, K. I., Hijjawi, R. S., Musleh, S. I., Baleanu, D. For the paper entitled: " The Hamilton Formalism with Fractional Derivatives"

This paper was published in: Journal of Mathematical Analysis and Applications, Volume 327, Issue 2, 2007.

Citations: 613 until 17/2/ 2016

Posts

1988-1992 Research Assistant, Physics Department, METU.

1993-1998 Assistant Prof., MutahUniversity.

1998-2000 Associate Prof., MutahUniversity.

1999-2000 Head of Physics Department, MutahUniversity

2000-2001 Associate Prof, Jordan University of Science and Technology (sabbatical year)

2001-2003	Associate Prof., MutahUniversity.
2003- 2005	Prof., MutahUniversity.
2005 – 2006	Jerash University (sabbatical year)
2006- 2008	Prof., MutahUniversity.
2008- Now	Prof. , Al al-Bayt University
2008 - 2010	Head of Physics Department, Al al-Bayt University
2010- 2014	The Dean of Faculty of Sciences
2015 – Now	The Dean of graduate studies

Courses in Physics I Taught

1.	General Physics (101, 102)
2.	General Physics Laboratories (111, 112)
3.	Quantum Mechanics 1 (351)
4.	Quantum Mechanics 2 (452)
5.	Mathematical Physics 1 (292)
6.	Mathematical Physics 2 (392)
7.	Classical Mechanics 1 (214)
8.	Classical Mechanics 2 (314)
9.	Nuclear Physics (442)
10.	Vibrations and waves (201)
11.	Optics (281)
12.	Mathematical Physics (591)
13.	Classical Mechanics (514)
14.	Quantum mechanics (551)

REFERENCES:

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Prof. Dr. Abdelrahim A. Hunaiti The University of Jordan