

# Prof. Mohammad Shikakhwa

## Personal Information

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## Research Areas

Theoretical High Energy Physics Studies, Quantum Mechanics, Fields Theory and Relativity

## Academic Titles / Tasks

Professor, TED University, Faculty of Arts and Sciences, Basic Sciences, 2022 - Continues

## Courses

Foundations and Frontiers of Science, Undergraduate, 2023 - 2024, 2022 - 2023

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Hamiltonian, geometric momentum and force operators for a spin zero particle on a curve: physical approach**  
Shikakhwa M., Chair N.  
European Physical Journal Plus, vol.139, no.6, 2024 (SCI-Expanded)
- II. **Constructing Hermitian Hamiltonians for spin zero neutral and charged particles on a curved surface: physical approach**  
Shikakhwa M., Chair N.  
European Physical Journal Plus, vol.137, no.5, 2022 (SCI-Expanded)
- III. **The quantum centripetal force on a free particle confined to the surface of a sphere and a cylinder**  
Shikakhwa M.  
Physica E: Low-Dimensional Systems and Nanostructures, vol.108, pp.249-252, 2019 (SCI-Expanded)
- IV. **Ring symmetry in electric potential calculation extended to discs and cylinders**  
Charyyev A., Shikakhwa M.  
European Journal of Physics, vol.39, no.6, 2018 (SCI-Expanded)
- V. **Symmetric Surface Momentum and Centripetal Force for a Particle on a Curved Surface**  
Shikakhwa M.  
Communications in Theoretical Physics, vol.70, no.3, pp.263-267, 2018 (SCI-Expanded)
- VI. **Spin force and torque in non-relativistic Dirac oscillator on a sphere**  
Shikakhwa M.  
Physics Letters, Section A: General, Atomic and Solid State Physics, vol.382, no.12, pp.855-859, 2018 (SCI-

Expanded)

- VII. **Pure gauge spin-orbit couplings**  
Shikakhwa M.  
European Physical Journal Plus, vol.132, no.1, 2017 (SCI-Expanded)
- VIII. **Hermitian and gauge-covariant Hamiltonians for a particle in a magnetic field on cylindrical and spherical surfaces**  
Shikakhwa M., Chair N.  
European Journal of Physics, vol.38, no.1, 2017 (SCI-Expanded)
- IX. **Hamiltonian for a particle in a magnetic field on a curved surface in orthogonal curvilinear coordinates**  
Shikakhwa M., Chair N.  
Physics Letters, Section A: General, Atomic and Solid State Physics, vol.380, no.36, pp.2876-2880, 2016 (SCI-Expanded)
- X. **Hermitian spin-orbit Hamiltonians on a surface in orthogonal curvilinear coordinates: A new practical approach**  
Shikakhwa M., Chair N.  
Physics Letters, Section A: General, Atomic and Solid State Physics, vol.380, no.22-23, pp.1985-1989, 2016 (SCI-Expanded)
- XI. **SU(2) symmetry and conservation of helicity for a Dirac particle in a static magnetic field at first order**  
Shikakhwa M., Albaid A.  
Revista Mexicana de Fisica, vol.63, no.5, pp.474-480, 2014 (SCI-Expanded)
- XII. **Gauge covariance and spin-current conservation in the gauge-field formulation of systems with spinorbit coupling**  
Shikakhwa M., TURGUT S., Pak N.  
Journal of Physics A: Mathematical and Theoretical, vol.45, no.10, 2012 (SCI-Expanded)
- XIII. **The  $\nabla \rightarrow \cdot e \rightarrow$  term does not change the Aharonov-Casher scattering cross section**  
Shikakhwa M., Al-Qaq E.  
Journal of Physics A: Mathematical and Theoretical, vol.43, no.35, 2010 (SCI-Expanded)
- XIV. **The aharonov-casher scattering: The effect of the  $\nabla \cdot e$  term**  
Al-Qaq E., Shikakhwa M.  
Modern Physics Letters A, vol.25, no.18, pp.1531-1540, 2010 (SCI-Expanded)
- XV. **Effective polar potential in the central force Schrödinger equation**  
Shikakhwa M., Mustafa M.  
European Journal of Physics, vol.31, no.1, pp.151-156, 2010 (SCI-Expanded)
- XVI. **The spin interaction of a dirac particle in an aharonov-bohm potential in first order scattering**  
Albeed A., Shikakhwa M.  
International Journal of Theoretical Physics, vol.47, no.10, pp.2748-2753, 2008 (SCI-Expanded)
- XVII. **Dirac particle in an Aharonov-Bohm potential: The structure of the first order S-matrix**  
Shikakhwa M.  
International Journal of Theoretical Physics, vol.46, no.2, pp.405-416, 2007 (SCI-Expanded)
- XVIII. **Perturbative study of bremsstrahlung and pair-production by spin-1/2 particles in the Aharonov-Bohm potential**  
Al-Binni U., Shikakhwa M.  
International Journal of Theoretical Physics, vol.44, no.9, pp.1399-1412, 2005 (SCI-Expanded)
- XIX. **Scalar pair production in the Aharonov-Bohm potential**  
Shahin G., Shikakhwa M.  
Journal of Physics A: Mathematical and General, vol.38, no.3, pp.759-772, 2005 (SCI-Expanded)
- XX. **Partial wave analysis of the first order Born amplitude of a Dirac particle in an Aharonov-Bohm potential**  
Shikakhwa M., Pak N.

Physical Review D - Particles, Fields, Gravitation and Cosmology, vol.67, no.10, 2003 (SCI-Expanded)

**XXI. Non-relativistic fermions interacting through the Chern-Simons field and the Aharonov-Bohm scattering amplitude**

Fainberg V., Pak N., Shikakhwa M.

Journal of Physics A: Mathematical and General, vol.31, no.15, pp.3531-3543, 1998 (SCI-Expanded)

**XXII. The path integral quantization and the construction of the S-matrix operator in the Abelian and non-Abelian Chern-Simons theories**

Fainberg V., Pak N., Shikakhwa M.

Journal of Physics A: Mathematical and General, vol.30, no.11, pp.3947-3965, 1997 (SCI-Expanded)

## **Articles Published in Other Journals**

**I. The Born scattering amplitude of a non-relativistic spin one-half particle in an Aharonov-Bohm potential**

Romia Y., Shikakhwa M.

Turkish Journal of Physics, vol.28, no.2, pp.73-79, 2004 (Scopus)

**II. Topological unitarity identities in Chern-Simons theories**

Fainberg V., Shikakhwa M.

Physical Review D - Particles, Fields, Gravitation and Cosmology, vol.53, no.10, pp.5765-5770, 1996 (Scopus)