Ishmael Takyi

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RESEARCH

Interests	Theoretical Physics · Nuclear Physics · Mathematical Physics · Modelling · Differential Equations
Areas	Atomic and Molecular Physics, and Optics · Statistical and Nonlinear Physics · Control and Systems Engineering · Modeling and Simulation · Electrical and Electronic Engineering · Materials Chemistry

RESEARCH SUMMARY

19	76	5	4	1.70	17%
Publications	Citations	h-index	i10-index	Field-weighted impact	World top 10%

Counted from the 19 publications listed below, 2020–2026. Field-weighted impact is the mean over the 18 works scored for it; 1.00 is the world average for works of the same field, type and year. 3 of the 18 papers scored for it are among the world's most cited tenth for their field, type and year.

PUBLICATIONS

Journal articles 19

1. Mordecai Opoku Ohemeng, Joseph Ackora-Prah, Benedict Barnes, **Ishmael Takyi** (2026). Energy orthogonality and conformational recovery dynamics of torsional DNA solitons. *Physica A Statistical Mechanics and its Applications*. https://doi.org/10.1016/j.physa.2026.131995
2. Mordecai Opoku Ohemeng, Bernard Asamoah Afful, Joseph Ackora-Prah, Benedict Barnes, **Ishmael Takyi** (2026). Enhancing autonomous vehicle control with lateral error feedback analysis. *IFAC Journal of Systems and Control*. https://doi.org/10.1016/j.ifacsc.2025.100359
3. Mordecai Opoku Ohemeng, Joseph Ackora-Prah, Benedict Barnes, **Ishmael Takyi** (2026). Nonlinear dynamics and topological transitions in DNA supercoiling. *Nonlinear Dynamics*. https://doi.org/10.1007/s11071-026-12400-3
4. Mordecai Opoku Ohemeng, Joseph Ackora-Prah, Benedict Barnes, **Ishmael Takyi** (2026). Stability of periodic orbits in the perturbed sine-Gordon equation. *Nonlinear science.*. https://doi.org/10.1016/j.nls.2026.100124
5. Mordecai Opoku Ohemeng, Joseph Ackora-Prah, Benedict Barnes, **Ishmael Takyi** (2025). Proportional feedback and optimal control of perturbed sine-Gordon kink solitons. *Chaos Solitons & Fractals*. https://doi.org/10.1016/j.chaos.2025.116645
6. Kwasi Frempong Sarfo, William Obeng-Denteh, **Ishmael Takyi**, Kwaku Forkuoh Darkwah (2024). A Force Function Formula for Solutions of Nonlinear Weakly Singular Volterra Integral Equations. *European Journal of Pure and Applied Mathematics*. https://doi.org/10.29020/nybg.ejpam.v17i2.5071
7. Samuel Okyere, Joseph Ackora-Prah, Ebenezer Bonyah, Bennedict Barnes, Maxwell Akwasi Boateng, **Ishmael Takyi**, Samuel Akwasi Adarkwa (2023). Hypertension and COVID-19 fractional derivative model with double dose vaccination. *F1000Research*. https://doi.org/10.12688/f1000research.133768.1
8. **I. Takyi**, H. Weigel (2023). Quantum effects of solitons in the self-dual impurity model. *Physical review. D/ Physical review. D.*. https://doi.org/10.1103/physrevd.107.036003
9. Joseph Ackora Prah, Valentine Acheson, Benedict Barnes, **Ishmael Takyi**, Emmanuel Owusu-Ansah (2022).

A 2-Phase Method for Solving Transportation Problems with Prohibited Routes. *Pakistan Journal of Statistics and Operation Research*. https://doi.org/10.18187/pjsor.v18i3.3911

10. Amos Odoom, Francis T. Oduro, Kwaku Darkwah, **Ishmael Takyi** (2022). Determination of the Exact Eigenvalues and Eigenfunctions of a Class of Quantum Anharmonic Oscillators with Polynomial Potential Functions. *Journal of Mathematics Research*. https://doi.org/10.5539/jmr.v14n1p72
11. **I. Takyi**, S. Gyampoh, B. Barnes, J. Ackora-Prah, G.A. Okyere (2022). Kink collision in the noncanonical φ 6 model: A model with localized inner structures. *Results in Physics*. https://doi.org/10.1016/j.rinp.2022.106197
12. Benedict Barnes, **Ishmael Takyi**, Bright Emmanuel Owusu, Francis Ohene Boateng, Augustine Saahene, Emmanuel Saarah Baidoo, Jennifer Aduko Adombire (2022). Mathematical Modelling of the Spatial Epidemiology of COVID-19 with Different Diffusion Coefficients. *International Journal of Differential Equations*. https://doi.org/10.1155/2022/7563111
13. **ISHMAEL TAKYI**, BENEDICT BARNES, HOESE MICHEL TORNYEVIADZI, JOSEPH ACKORA-PRAH (2022). Scattering of kinks in noncanonical sine-Gordon Model. *TURKISH JOURNAL OF PHYSICS*. https://doi.org/10.55730/1300-0101.2690
14. Benedict Barnes, Isaac Addai, Francis Ohene Boateng, **Ishmael Takyi** (2022). Solving the Helmholtz Equation Together with the Cauchy Boundary Conditions by a Modified Quasi-Reversibility Regularization Method. *Journal of Mathematics*. https://doi.org/10.1155/2022/5336305
15. Benedict Barnes, **Ishmael Takyi**, Joseph Ackora-Prah, George Hughes, Emmanuel Saarah Baidoo (2022). The mathematical model for marital interactions in Ghana. *Scientific African*. https://doi.org/10.1016/j.sciaf.2022.e01449
16. Daniel Ansong, **Ishmael Takyi** (2021). Chiral Soliton Models and Nucleon Structure Functions. *Symmetry*. https://doi.org/10.3390/sym13010108
17. **Ishmael TAKYI**, Benedict BARNES, Joseph ACKORA-PRAH (2021). Vacuum polarization energy of the kinks in the sinh-deformed models. *TURKISH JOURNAL OF PHYSICS*. https://doi.org/10.3906/fiz-2103-32
18. **I Takyi** (2020). Quantum corrections to solitons in the model. *Physical Review D*.
19. **I. Takyi**, M. K. Matfunjwa, H. Weigel (2020). Quantum corrections to solitons in the ϕ8 model. *Physical review. D/Physical review. D.*. https://doi.org/10.1103/physrevd.102.116004