

Tigran Kalaydzhyan, PhD

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PROFESSIONAL EXPERIENCE

Business Owner, Atomic Developers, Abilene, TX **2021 – Present**

Deal structuring, wealth management, financial and technical consulting, independent publishing.

- Currently managing:
 - **Quantum Mosaic LLC**, 506(c) real estate fund (debt and equity)
 - **Quantum Potential LLC**, lending partnership
 - **Quantum Edge LLC**, venture capital partnership
- Responsibilities include deal underwriting, due diligence, deal structuring & negotiations, portfolio management, fundraising, marketing, accounting, legal & compliance.
- On the real estate financing side, \$8.7M issued across 55 loans and equity deals, with zero foreclosures. \$1M+ profit to investors to date. We also finance early development, subdivisions, entitlements, land conservation projects, etc.
- Due diligence, deal structuring and consulting for several alternative investment projects, with ~\$10M in funds raised to date. The projects include private equity, private debt, agriculture, film bridge loans, tequila aging, fine wine syndication, and private placements in a medical receivables fund and a music royalty portfolio.
- Co-investing personal capital alongside partners in every syndicated deal.

Business Owner, Abilene Rental Homes, Abilene, TX **2020 – 2023**

- Acquired, managed, renovated and turned around 15 rental units in Texas and Indiana, doubling capital in 3 years. Used my own capital with bank and private loans.
- Acquired 42 land parcels through direct marketing, improved and resold them, generating a 5× return within one year.
- Developed AWS infrastructure for real estate data collection.

Physics Professor, Abilene Christian University and Cisco College, Abilene, TX **2020 – 2021**

Quantitative Analyst, A.R.T. Advisors LLC, New York, NY **2019 – 2020**

- Developed and implemented mid- and low-frequency statistical arbitrage strategies for a \$5B equity portfolio, generating marginal P&L at a Sharpe ratio of 2.
- Rebuilt and improved the live production codebase supporting 30% of the fund's existing forecasts.

Researcher, NASA Jet Propulsion Laboratory, California Institute of Technology **2016 – 2018**

- Developed simulation software for the NASA Cold Atom Laboratory on board the International Space Station and the European Space Agency's ACES atomic clock mission.
- Created methods for gravity tests and dark matter searches.

Research Associate in Theoretical Nuclear Physics, University of Illinois at Chicago **2015 – 2016**

- Developed novel theoretical methods to test Einstein's theory of gravity using particle accelerators, and analyzed experimental data to investigate possible gravitational effects on high-energy particles and antimatter.

Research Associate in Theoretical Nuclear Physics, Stony Brook University, NY **2013 – 2015**

- Developed theoretical hydrodynamic methods predicting properties of quark-gluon plasma in heavy-ion collisions, cosmic rays and the early universe.
- Discovered hydrodynamic properties of proton-proton collisions at the LHC.

Researcher, DESY Hamburg, Germany and ITEP Lattice Group, Russia **2010 – 2013**

- Connected dynamics of classical fields and strings in high-dimensional curved spaces with real-life properties of quark matter in accelerator experiments.
- Wrote numerical solvers for time-dependent nonlinear ODEs and PDEs (general relativity, supergravity and string theory) and a high-performance Monte Carlo package for lattice QCD.
- Found exact solutions of hydrodynamic equations in the presence of electromagnetic fields, rotation and quantum anomalies.

DEGREES AND LICENSES

Investment Adviser (RIA CRD# 329096; IAR CRD# 325366), Series 65	2023 – 2026
Texas Real Estate Agent, License #740982	2020 – 2022
Certificate in Deep Learning, Coursera.org, License #HAW4JL726QV9	2017
Ph.D. (Doctor of Natural Sciences), with honors, University of Hamburg, Germany Thesis: “Quark-gluon plasma in strong magnetic fields,” DESY-THESIS-2013-010	2013
Specialist Diploma in Theoretical Physics, summa cum laude Department of Physics, Lomonosov Moscow State University	2010

SKILLS AND LANGUAGES

Programming Languages: Python, C, C++ (98, 11, 14), Mathematica, Perl, Matlab, Maple, Fortran, x86/ARM assembly.
Natural Languages: Native: Russian | Fluent: English | Working proficiency: Spanish, German | Currently refreshing: French, Armenian.

PUBLICATIONS

Book: T. Kalaydzhyan, *The Art of Deal Structuring*, 2026, ISBN: 979-8172413995 [\[View book on Amazon\]](#)

Research: Author or co-author of 35 scientific publications, including multiple single-author papers. 1000+ citations, 100+ conference talks and invited seminars.

Selected publications (full publication record: [Google Scholar](#)):

1. T. Kalaydzhyan, N. Yu, “Searching for stochastic background of ultra-light fields with atomic sensors”, Universe 2018, 4(10), 99.
2. T. Kalaydzhyan, N. Yu, “Extracting dark matter signatures from atomic clock stability measurements”, Phys. Rev. D 96 (2017) 075007.
3. T. Kalaydzhyan, E. Murchikova, “Thermal chiral vortical and magnetic waves: new excitation modes in chiral fluids”, Nucl. Phys. B 919 (2017) 173.
4. T. Kalaydzhyan, “Comment on Testing Planck-scale gravity with accelerators”, Phys. Rev. Lett. 116, 209001 (2016).
5. T. Kalaydzhyan, “Gravitational mass of positron from LEP synchrotron losses”, Sci. Rep. 6, 30461 (2016) [Nature Publishing Group].
6. T. Kalaydzhyan, “Gravitational mass of relativistic matter and antimatter”, Phys. Lett. B 751 (2015) 29.
7. T. Kalaydzhyan, “Testing general relativity on accelerators”, Phys. Lett. B 750 (2015) 112.
8. T. Kalaydzhyan, E. Shuryak, “Collective flow in high-multiplicity proton-proton collisions”, Phys. Rev. C 91 (2015) 054913.
9. T. Kalaydzhyan, E. Shuryak, “Gravity waves generated by sounds from Big Bang phase transitions”, Phys. Rev. D 91 (2015) 083502.
10. T. Kalaydzhyan, E. Shuryak, “Why is the radial flow in central pA collisions stronger than in AA?”, Nucl. Phys. A 931 (2014) 899.
11. T. Kalaydzhyan, E. Shuryak, “Collective interaction of QCD strings and early stages of high multiplicity pA collisions”, Phys. Rev. C 90 (2014) 014901.
12. T. Kalaydzhyan, “On the temperature dependence of the chiral vortical effects”, Phys. Rev. D 89 (2014) 105012.
13. T. Kalaydzhyan, E. Shuryak, “Self-interacting QCD strings and string balls”, Phys. Rev. D 90 (2014) 025031.
14. M. N. Chernodub, T. Kalaydzhyan, J. Van Doorselaere, H. Verschelde, “Fermion zero modes in a chromomagnetic vortex lattice”, Phys. Rev. D 89 (2014) 065021.
15. Id. Ben-Dayan, T. Kalaydzhyan, “Constraining the primordial power spectrum from SNIa lensing dispersion”, Phys. Rev. D 90 (2014) 083509.
16. M. N. Chernodub, T. Kalaydzhyan, J. Van Doorselaere, H. Verschelde, “On chromoelectric (super)conductivity of the Yang-Mills vacuum”, Phys. Lett. B 730 (2014) 63.
17. T. Kalaydzhyan, “Chiral superfluidity of the quark-gluon plasma”, Nucl. Phys. A 913 (2013) 243.
18. Il. Gahramanov, T. Kalaydzhyan, I. Kirsch, “Anisotropic hydrodynamics, holography and the chiral magnetic effect”, Phys. Rev. D 85, 126013 (2012).
19. P. V. Buividovich, T. Kalaydzhyan, M. I. Polikarpov, “Fractal dimension of the topological charge density distribution in SU(2) lattice gluodynamics”, Phys. Rev. D 86, 074511 (2012).
20. T. Kalaydzhyan, I. Kirsch, “Fluid-gravity model for the chiral magnetic effect”, Phys. Rev. Lett. 106, 211601 (2011).
21. N. Evans, T. Kalaydzhyan, K.-Y. Kim, I. Kirsch, “Non-equilibrium physics at a holographic chiral phase transition”, JHEP 1101, 050 (2011).
22. T. Kalaydzhyan, I. Kirsch, “Holographic dual of a boost-invariant plasma with chemical potential”, JHEP 1102, 053 (2011).
23. P. V. Buividovich, M. N. Chernodub, D. E. Kharzeev, T. Kalaydzhyan, E. V. Luschevskaya, M. I. Polikarpov, “Magnetic-field-induced insulator-conductor transition in SU(2) quenched lattice gauge theory”, Phys. Rev. Lett. 105, 132001 (2010).