PUBLIC RESEARCH PORTFOLIO

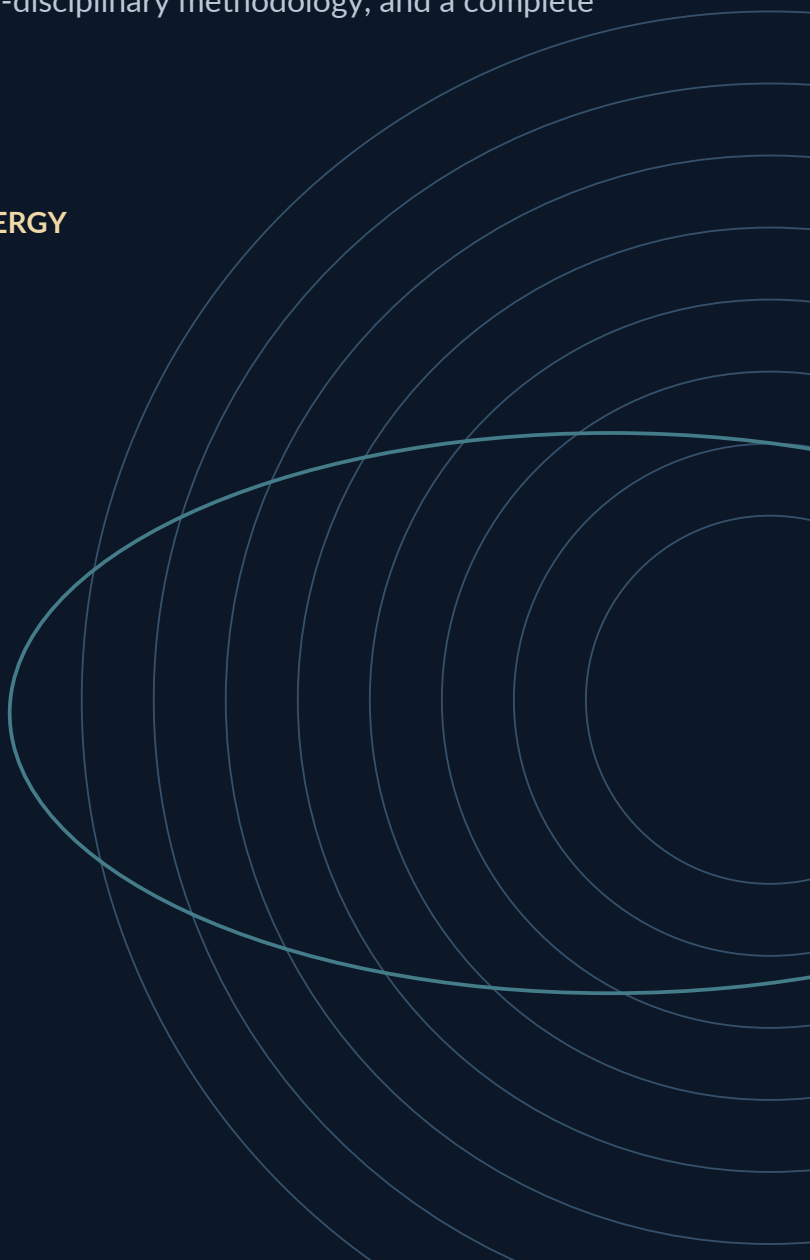
THE STRUCTURE OF THE UNIVERSE

Quantum States & Energy Dynamics

Three flagship theoretical manuscripts, a cross-disciplinary methodology, and a complete inventory of 66 public research topics.

01 COSMOLOGY / 02 GLAUBER STATE / 03 ENERGY

Author: Mr.K
Theoretical and computational research
Non-confidential research overview



PUBLIC EDITION | 12 OCTOBER 2026

PORTFOLIO AT A GLANCE

Executive overview

A public-facing account of scope, intent, and verification boundaries.

This portfolio brings together three flagship theoretical-physics manuscripts and a consolidated, non-duplicative register of 66 research topics. It is written for academics, potential collaborators, and interested general readers. The text reports research directions and manuscript-level constructions; it does not present speculative objectives as verified physical achievements.

03	66	05
FLAGSHIP MANUSCRIPTS	RESEARCH TOPICS	RESEARCH DOMAINS

Three independent questions

Cosmology asks how spacetime, matter, cosmic structure, and observational quantities can be connected within a coherent mathematical construction. The Glauber-state program asks how selected coherent quantum states and spectral branches may be controlled in a connected macroscopic system. The energy program asks how nonequilibrium branch transitions, electromagnetic resonance, and quantum-state transport relate to recoverable work and energy accounting.

Common mathematical vocabulary

The research repeatedly employs Gaussian analysis, three-torus (T^3) geometry, solid-torus domains, Möbius-type twisted boundary conditions, Fourier and spectral methods, operator theory, and established equations of gravitational, electromagnetic, and quantum physics. These tools serve different roles in different projects; their joint use is a method of inquiry, not evidence that every proposed device performs better.

How to read the status of the work

The portfolio distinguishes: (i) established mathematical statements under explicit hypotheses; (ii) derived or simulated predictions within specified models; (iii) proposed physical interpretations; and (iv) experimental or observational claims that remain to be validated. The existence of a manuscript, numerical optimization, or theoretical limiting result must not be confused with external peer review or hardware certification.

> **Research throughline: foundational geometry → coherent quantum-state control → nonequilibrium energy-state dynamics.**

NAVIGATION

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The first major section describes the three flagship manuscripts. The next section explains the cross-cutting mathematical framework. The final major section preserves the complete numbered inventory of 66 topics, grouped into five domains. A research-status and disclosure note concludes the document.

Public-release principle

This document deliberately excludes undisclosed hardware dimensions, circuit details, operating values, resonance settings, unpublished derivations, internal source archives, and identifying personal information. The author is represented only as Mr.K.

THEORY OF THE UNIVERSE

Flagship 01 | Ontological reconstruction of spacetime

From mathematical structure to spacetime, matter, cosmic history, and observable phenomena.

The cosmology manuscript investigates whether the structure of spacetime and the physical world can be organized within a single non-circular sequence of mathematical constructions, rather than introduced as unrelated starting assumptions. It aims to connect local geometry, global topology, quantum and material sectors, cosmic evolution, and measurable predictions.

Central research question

Why does the universe have its observed spatial and temporal structure, and how can that structure be connected to matter, field dynamics, the formation of cosmic objects, and the signals measured by observers? Modern general relativity provides a highly successful dynamical relation between geometry and energy-momentum. The further task posed by this manuscript is to investigate how the relevant spacetime data and physical sectors could be constructed and related within a logically ordered framework.

Spacetime geometry and topology

A space may be locally flat while exhibiting a nontrivial global identification pattern. The manuscript studies periodic three-dimensional geometry and the mathematical conditions under which a three-torus (T^3) can appear as a global endpoint. It also distinguishes a solid-torus domain from Möbius-type twists or monodromy. These spaces are not interchangeable: a three-torus is a closed three-dimensional manifold, a solid torus has a different global structure, and a Möbius twist specifies nontrivial transport of orientation or phase around a loop.

The use of geometry serves a scientific purpose: global identifications and boundary conditions can affect allowed field modes, propagation, spectral gaps, and the organization of observable quantities. The program therefore treats topology as a hypothesis or derived structural statement whose physical implications must be checked, not as a visual metaphor for the shape of the sky.

Optical redshift and observational geometry

Light from distant astrophysical sources carries information about its path, its emission and observation events, and the geometry through which it travels. Standard cosmology connects measured redshift to the evolving spacetime metric. The manuscript studies redshift-based reconstruction and alternative geometric interpretations through optical transport and observer-dependent quantities, seeking a forward derivation from stated field and geometric data to measurable signals.

A physically successful alternative account of redshift would have to reproduce not only one distance-redshift relation but also the cosmic microwave background, large-scale structure, lensing, supernova observations, time-dependent phenomena, and independent distance measures. The existence of a mathematical transport representation does not by itself establish observational equivalence with the standard cosmological model.

Cosmic origin, lineage, and time

The cosmology program examines the origin and continuation of cosmic states, including a proposed lineage of generated universes. It explicitly separates different kinds of time: local physical time measured inside a universe, parameters labeling a mathematical continuation, and transition or residence intervals in a proposed history. This separation is important because mathematical labels and observable clocks cannot be identified without proof.

The lineage component is an element of the manuscript's theoretical construction, not an observationally established chronology or a confirmed count of physical universes. Its role in the public account is to show the scope of the research: the author is examining both local cosmic evolution and the larger structure assigned to possible histories.

From fields and particles to cosmic structure

The manuscript extends its formal organization beyond geometry into quantum field theory, standard-model sectors, nuclear and atomic physics, condensed matter, information records, and the thermodynamic and many-body description of matter. It then follows the conceptual chain into primordial chemistry, stars, compact remnants, black holes, galaxies, galaxy clusters, gravitational lensing, and the cosmic web.

The point is not to claim that all microscopic forces and all astrophysical observations have already been independently derived from a unique minimal principle. Rather, the program tests whether each downstream sector can be connected to previously specified geometric and physical structures without importing an unannounced assumption.

Observational test and scientific boundary

Cosmological proposals become empirical theories only when they yield quantitative predictions that survive independent checks. The manuscript therefore discusses perturbations, anisotropy, cosmic structure, distance measurements, gravitational signals, and comparisons with published cosmological observations. The status of these analyses should be distinguished from broad acceptance of the proposed cosmology, which would require replication, careful model comparison, and strong observational agreement.

> **Public synopsis: a unified cosmology program linking the possible mathematical origin of spacetime to quantum fields, cosmic structure, and measurable astrophysical phenomena.**

Topics developed within this flagship program

- Global topology, three-torus endpoint geometry, solid-torus and Möbius-related structures
- Optical redshift, light propagation, cosmic distance, and observational time
- Cosmic genesis, generation or lineage structure, and distinct time coordinates
- Quantum field, matter, thermodynamic, and information-theoretic sectors
- Primordial matter, stellar evolution, black holes, galaxies, and the cosmic web
- Cosmic microwave background, lensing, structure growth, validation, and falsifiability

QUANTUM COHERENCE AND MATTER

Flagship 02 | Pure Glauber states in macroscopic systems

Coherent-state preparation, spectral transfer, and whole-system accounting.

The second flagship manuscript studies whether a connected physical system that is conventionally described at the macroscopic scale can support a precisely controlled transition into a selected coherent quantum-state sector. The object of study is not merely a strongly driven classical oscillator: it is a quantum Hamiltonian description that retains interactions, fields, sources, and the global accounting of energy and momentum.

What is a Glauber coherent state?

In quantum optics, a Glauber coherent state is a special quantum state closely related to the oscillation of a classical electromagnetic wave. It has a well-defined mathematical structure and is central to the quantum description of laser light. The word "coherent" does not simply mean regular motion or large-amplitude vibration; it refers to phase-sensitive properties of a quantum state and, in the pure-state setting, its density-operator structure.

This distinction matters especially for macroscopic devices. A mechanical or electromagnetic resonance is not, on its own, evidence that a large connected object has been prepared in a pure quantum state. Preparation, isolation from uncontrolled degrees of freedom, state transfer, and reproducible observables require separate analysis.

From microscopic control to a connected device

The paper employs coordinated toroidal electromagnetic controls as a means of studying phase-sensitive interactions. Their role is to address collective degrees of freedom of a single connected physical system. Rather than postulating an independent mechanism for each desired outcome, the model seeks to derive allowed transitions from an underlying whole-device Hamiltonian.

A central methodological requirement is to include all relevant sources of energy and momentum: the matter subsystem, electromagnetic fields, mechanical components, supports, and the controller. A predicted mass-related or motion-related response is meaningful only after these contributions have been distinguished and the physical observable has been defined.

Selected spectral branches and mass-related observables

Quantum systems may possess distinct sectors or branches of their spectra. This research explores transfer between selected branches and the interpretation of special sectors with a vanishing rest-energy gap in the relevant mathematical representation. It also examines how stress-energy, momentum, and subsystem mass observables must be computed when interactions and boundaries are present.

This is not equivalent to an experimental demonstration that a macroscopic object loses all gravitational or inertial mass. A spectral statement in a controlled Hamiltonian class is a theory-level statement. Its translation into measurable force, mass, or displacement requires verified couplings, complete boundary terms, and a physically realizable apparatus.

Preparation, switching, retention, and restoration

A quantum-state protocol is incomplete if it only specifies an intermediate state under continuous driving. The manuscript studies the preparation stage, subsequent switching, the possible persistence of selected states after an external interaction is turned off, and a formal route back to the initial state. Each stage has its own time scales and conservation requirements.

The research also distinguishes mathematical endpoint maps from motion through ordinary space. An operator representation that omits intermediate positions does not by itself demonstrate instantaneous material transport or faster-than-light signalling. Any practical implementation remains constrained by the causal propagation of fields and by experimentally measurable operations.

Connection to quantum technologies

Coherent-state preparation, protected subspaces, state recovery, and transport operators have conceptual links to quantum memories, quantum information processing, photonic interfaces, and sensors. The manuscript explores such connections as possible extensions of the same general state-space framework. Their technical viability would depend on noise, decoherence, leakage, calibration, and component-level performance.

Scope of the contribution

The public significance of this work is its attempt to address macroscopic matter through quantum spectral structure and controlled coherent-state transitions while retaining a consistent whole-system ledger. Mathematical constructions, numerical illustrations, and device proposals are distinct levels of evidence; none should be treated as an externally verified demonstration of macroscopic mass removal or unrestricted quantum transport.

> **Public synopsis: a quantum-control program investigating the preparation, transfer, retention, and recovery of coherent states in an interacting macroscopic system.**

ENERGY-STATE DYNAMICS

Flagship 03 | Nonequilibrium energy and resonance

Electromagnetic control, metastability, spectral stiffness, and recoverable work.

The third flagship paper examines how electromagnetic control can change the energy landscape of a prepared nonequilibrium system, how this can create or expose transitions between operating branches, and what part of the resulting energy difference might be transferred to an output channel. Its defining feature is the attempt to account for work and energy inside a common physical description.

Metastability and the energy landscape

A physical system may remain in a metastable state even though another state has lower energy. A barrier, a constraint, or an external control can prevent an immediate transition. When operating conditions change, the local stability of a state may also change, permitting relaxation or another form of state conversion. This is a familiar principle in phase transitions and nonequilibrium physics.

The manuscript treats instability and relaxation through response operators and energy functionals. It asks whether a controlled state transition can be analyzed as a definite change in an operating energy landscape rather than as an unspecified source of energy. In the public presentation, the key notion is a transition between well-defined states of a physical system, not an assumption that energy appears from nothing.

Quantum vacuum and physical resource accounting

Quantum field theory associates fluctuations and correlations with vacuum states. These properties do not imply that a true ground state of an unchanged closed Hamiltonian can supply unlimited net cyclic work. The paper distinguishes the state of a system before and after control parameters alter its dynamics, and treats the energy difference of operating branches as the potential work-relevant quantity.

A zero-point fluctuation may play a role in seeding a transition only after the relevant stability conditions have changed. Such a seed is not the same thing as an external inexhaustible fuel supply. Any claim of useful output must include the energetic cost of preparing the system, operating the controller, and handling losses.

Resonance, stiffness, and response

Resonance occurs when the dynamical response of a system is strongly coupled to a driving process or another mode. The manuscript investigates the interaction of resonant transfer with small effective stiffness and the development of a strongly responsive branch. Mathematical limiting procedures can amplify susceptibilities or yield diverging expressions under precisely specified model conditions.

Such limits do not demonstrate infinite physical output from a finite device. Real materials, bandwidth, nonlinearity, finite resources, thermal response, and finite duration can constrain the attainable process. The distinction between an ideal mathematical limit and a tested apparatus is therefore central to a defensible scientific description of the research.

Conservation, storage, and useful output

The paper explicitly separates the roles of externally supplied drive energy, internal state-energy differences, stored energy, transferred work, and dissipative losses. It asks whether an identifiable transition energy can be delivered through a controlled output channel while preserving the full energy balance of the apparatus and its environment.

This question goes beyond simply maximizing the amplitude of a resonator. A large response is not necessarily a large net energy gain, and neither constitutes useful net power until the source, duty cycle, input energy, losses, and recipient load are specified.

Quantum-state and field representations

The manuscript extends its framework to representations of quantum-state transport and certain field-response descriptions. These are investigated as alternative mathematical views of a shared source or interaction, not as independent additional energy reservoirs. The aim is to preserve one underlying physical ledger while studying how state information and energy can be expressed in different mathematical channels.

Verification and applications

Potentially relevant areas include high-sensitivity resonant systems, electromechanical energy transfer, quantum-state conversion, energy storage, and more elaborate energy-processing architectures. Actual performance requires a realizable design, calibrated components, and reproducible measurements of total input and output. The manuscript's idealized analysis and any numerical examples cannot substitute for such evidence.

> **Public synopsis: a nonequilibrium energy research program that studies how controlled changes in stability and resonance alter state transitions and the transfer of recoverable energy.**

CROSS-DISCIPLINARY METHOD

A shared mathematical and physical framework

What Gaussian, T^3, solid-torus, and Möbius structures contribute.

Across the research portfolio, four mathematical structures appear repeatedly. Their roles depend on the application, and their combination is assessed through equations and operators rather than treated as a universal performance guarantee.

01 Gaussian analysis

Heat kernels, smoothing, spectral regularization, noise structure, localization, and analytic estimates.

02 Three-torus (T^3)

Periodic coordinates, spatial identifications, Bloch or Fourier modes, and multi-phase control variables.

03 Solid torus

Bounded toroidal domains, ring resonators, magnetic or optical transport geometry, and boundary-sensitive fields.

04 Möbius topology

Twisted orientation, antiperiodic conditions, nontrivial holonomy, parity exchange, and topological selection rules.

Additional analytic tools

Depending on the problem, the research also employs Fourier and Mellin methods, partial differential equations, nonperturbative estimates, spectral projections, dynamical systems, probability, numerical optimization, and proof certification. The mathematical constant π appears naturally in periodic phases and geometric identities; its use is not a stand-alone physical mechanism.

How the three manuscripts connect

The relationship is conceptual rather than an automatic implication. A cosmological construction does not prove an electromechanical device. A coherent-state transfer theorem does not independently prove recoverable energy production. The energy manuscript requires its own well-defined operating Hamiltonian, resource accounting, and implementation evidence. Maintaining these distinctions allows the three manuscripts to form a coherent research program without collapsing them into one overgeneralized claim.

CROSS-DISCIPLINARY INDEX

Complete research inventory | 66 topics

A consolidated record of unique research subjects, not a count of verified publications.

The following 66 subjects combine historical manuscript programs, later cumulative manuscripts, and distinct theoretical or engineering research tracks. Multiple manuscript revisions of the same research family are not counted as additional topics. Item numbers reproduce the classification supplied for this public release.

Foundational physics, cosmology, and emerging phenomena	**23**	01–23
Mathematics, theoretical statistics, and computational complexity	**17**	24–40
Quantum computing, quantum information, and photonics	**12**	41–52
Semiconductors, electronics, RF, and computing	**7**	53–59
Energy, thermal physics, and biophysics	**7**	60–66

The three flagship themes are visible within the index: ontological cosmology at Topic 10, mass-related spectral transfer at Topic 18, and electromagnetic/quantum-state energy transfer at Topic 19. The flagship narratives are expanded thematic accounts and are not three additional entries beyond the 66 subjects.

The nine historical foundational-physics manuscripts retain their original 01–09 group identity. Related later work may broaden or revisit these themes without being counted as new numbered titles.

TOPICS 01–23

Domain 01 | Foundational physics, cosmology, and emerging phenomena

Spacetime, gravitation, quantum fields, black holes, and electromagnetic-state problems.

The foundational program includes the historical nine-paper structure, expanded cosmological and black-hole directions, the two mass/energy-related flagship themes, and other emerging physical questions. The list records what is being studied, not an assertion that every speculative mechanism is real.

HISTORICAL FOUNDATIONAL MANUSCRIPTS / 01–09

01 **Mathematical foundations of nonperturbative quantum gravity**
Investigating how mathematical consistency, field reconstruction, and quantum-gravitational structures might connect general relativity with quantum field theory.

02 **Suppression of external gravitational response through vacuum stiffness**
Studying whether special prepared physical states can modify the gravitational response inferred from external measurements.

03 **Late-universe spacetime geometry and T^3 topology**
Examining conditions for classical spacetime structure and the possible global topology of spatial sections.

04 **Nonequilibrium energy release and stiffness extraction**
Analyzing energy transfer from prepared states far from equilibrium under thermodynamic and standard-physics constraints.

05 **Vacuum energy and the cosmological-constant problem**
Investigating the gap between quantum-field estimates of vacuum energy and cosmologically inferred dark energy.

06 **Control of inertial and weak-gravity response**
Testing theoretical possibilities for altering motion-related and gravitational response through electromagnetic and quantum interactions.

07 **Toroidal electromagnetic levitation systems**
Developing Maxwell-based models of supporting and controlling objects with ring-shaped magnetic-field configurations.

08 **Cosmological perturbations and stability spectra**
Investigating the evolution and stability of small disturbances on cosmological backgrounds.

09 **Unified field dynamics**
Seeking compatible mathematical descriptions of gravitation, electromagnetic fields, and matter fields.

EXPANDED COSMOLOGY AND FUNDAMENTAL PHYSICS / 10–23

10 **Ontological reconstruction of spacetime**
The flagship cosmology program connecting geometry, optical redshift, matter, cosmic structure, and observables in a unified theoretical sequence.

11 **Topological vacuum energy and field locking**
Exploring how global topology and constrained field interactions may influence effective vacuum-energy structure.

12 **Nonsingular black-hole models**
Investigating whether classical singular behavior can be controlled or replaced in mathematically consistent black-hole descriptions.

13 **Black-hole information paradox and Page curve**
Studying quantum-information accounting during black-hole evaporation and the possible evolution of radiation entropy.

14 **Numerical gravity for black-hole formation and evaporation**
Using gravitational field equations and numerical methods to study collapse, evolution, and proposed quantum effects.

15 **Yukawa interactions and higher-order quantum cosmological corrections**
Analyzing interactions between particle fields and the influence of higher-order effects on cosmological quantities.

16 **Gaussian Hamiltonians and perturbative/nonperturbative methods**
Combining perturbation theory with nonperturbative operator methods to analyze quantum energy generators.

17 **Gaussian scalar fields and toroidal energy structure**
Studying field energy, stability, and nonlinear interactions on periodic spatial domains.

18 **Tri-toroidal transfer to a massless spectral branch**
Investigating controlled electromagnetic and quantum-state transitions associated with special mass-related spectral sectors in connected systems.

19 **Electromagnetic and quantum-current energy transfer and storage**
The flagship-related energy program connecting resonance, currents, state transitions, and conservation-based accounting of stored or transferred energy.

20 **Magnetic monopoles and their dynamics**
Examining whether isolated magnetic-charge configurations can arise within mathematically specified field theories.

21 **Neutrino properties and identity**
Exploring neutrino mass, symmetry, particle-state structure, and related field-theoretic interpretations.

22 **Quantum uncertainty, zero variance, and entanglement preservation**
Analyzing measurement uncertainty and the precise conditions for preserving quantum variance and entanglement under interactions.

23 **Spectral theory of possible room-temperature superconductivity**
Investigating electron-phonon spectra, pairing, stability, and physical constraints relevant to superconductivity near ambient temperatures.

TOPICS 24–40

Domain 02 | Mathematics, theoretical statistics, and computational complexity

Open conjectures, dynamical systems, machine-learning theory, cryptography, and high-dimensional inference.

Mathematics and theoretical computer science topics include both alternative proofs of established results and currently unresolved problems. Results obtained for restricted model classes do not constitute global, unconditional proofs of the corresponding famous conjectures.

24 **Riemann hypothesis**
Research on the nontrivial zeros of the Riemann zeta function and their connection to prime-number distribution.

25 **Yang–Mills existence and mass gap**
Studying the mathematical construction of quantum gauge theory and conditions for a positive spectral mass gap.

26 **Navier–Stokes global regularity**
Investigating smoothness and possible finite-time singularities for three-dimensional fluid equations.

27 **P versus NP**
Exploring the distinction between efficiently verifying solutions and efficiently finding them in general computation.

28 **Hodge conjecture**
Investigating relations between algebraic cycles and the topology of complex algebraic varieties.

29 **Birch and Swinnerton-Dyer conjecture**
Studying the relationship between rational points on elliptic curves and the behavior of associated L-functions.

30 **Poincaré theorem and the smooth four-dimensional Poincaré problem**
Exploring alternate proofs of established three-dimensional topology and the unresolved smooth four-dimensional case.

31 **Alternative approaches to Fermat's Last Theorem**
Reconstructing an already established theorem through geometric, topological, and analytic methods.

32 **Collatz conjecture**
Analyzing integer iterations and whether every positive integer ultimately reaches the trivial cycle.

33 **Chaos theory and global dynamical systems**
Studying attractors, stability, invariants, nonlinear flow, and topological structure in complex dynamics.

34 **Sample compression conjecture**
Researching whether compact representative subsets preserve generalization performance in learning theory.

35 **Learning Parity with Noise (LPN)**
Studying recovery of hidden binary structure from noisy observations and its computational significance for cryptography.

36 **Distribution-free learning of DNF formulas**
Developing and assessing algorithms for learning Boolean formulas without restrictive assumptions about the input distribution.

37 **Stochastic Block Model (SBM)**
Examining statistical and computational thresholds for recovering hidden communities in random networks.

38 **Gaussian Single-Index Model**
Researching the identification of informative directions in high-dimensional predictive systems.

39 **Planted Clique problem**
Studying the computational difficulty of finding a hidden complete subgraph inside a random graph.

40 **Gaussian–T^3 spectral inference and sparse PCA**
Analyzing noisy inverse problems, high-dimensional statistical structure, and the limits of efficient dimension reduction.

TOPICS 41–52

Domain 03 | Quantum computing, quantum information, and photonics

Quantum processors, coherent memories, sensors, optical circuits, and chemical quantum control.

Quantum-engineering topics span distinct hardware architectures. Published platform demonstrations, ideal gate models, and proposed integrated designs must remain separate evidence categories. No universal perfect-efficiency or fault-free hardware claim is implied.

41 **Photonic quantum computing**
Investigating quantum information processing based on single photons, interferometry, and optical circuits.

42 **Trapped-ion quantum computing**
Modeling quantum gates and control protocols for ions confined and manipulated using electromagnetic fields and lasers.

43 **Neutral-atom and Rydberg quantum computing**
Researching entangling interactions, gate control, and fault mechanisms in neutral-atom processors.

44 **Superconducting-circuit quantum computing**
Analyzing Josephson-based qubits, coherent gates, leakage, and noise in multilevel circuit models.

45 **Quantum communication and error correction**
Studying long-distance quantum-state transfer and methods for correcting transmission and processing errors.

46 **Quantum memory**
Investigating storage, retrieval, coherence retention, and interfacing of photonic or material quantum states.

47 **Room-temperature photon-number-resolving detection**
Designing detector concepts capable of distinguishing one photon from multiple incident photons at ambient temperature.

48 **Three-axis NV-center quantum magnetometry**
Exploring diamond quantum defects for vector measurements of weak magnetic fields.

49 **WSe_2 single-photon sources and Hong–Ou–Mandel interference**
Studying photon indistinguishability and interference quality from two-dimensional semiconductor emitters.

50 **Quantum photonic integrated circuits (QPIC)**
Investigating chip-scale integration of quantum emitters, waveguides, resonators, and optical gates.

51 **Silicon photonics and phase-controlled resonators**
Analyzing photonic routing, optical phase control, and resonant structures on silicon platforms.

52 **Quantum-controlled chemistry**
Studying whether phase-sensitive optical fields and quantum interference can influence molecular reaction channels.

TOPICS 53–59

Domain 04 | Semiconductors, electronics, RF, and computing

Nanoscale transport, power electronics, radio-frequency devices, interconnects, and low-dissipation computation.

Electronics topics focus on models and design constraints such as leakage, loss, noise, parasitic coupling, fabrication tolerance, and energy dissipation. The descriptions do not imply production-qualified silicon or hardware certification.

53 **Möbius-type quantum-interference transistor (FTQIT)**
Exploring electronic switching through interference effects in twisted or topologically structured nanoscale devices.

54 **Ultra-low-voltage transistors**
Investigating energy-selective transmission and device structures for switching with reduced voltage and power.

55 **GaN power-semiconductor EMI and switching-loss suppression**
Studying simultaneous reduction of electromagnetic interference, switching losses, ringing, and heating in high-speed converters.

56 **Topology-aware RF filters and resonant circuits**
Analyzing selective signal transmission, parasitic resonances, and robustness against manufacturing defects.

57 **Magnet-free RF circulators**
Exploring directional microwave signal routing without conventional ferrite-based magnetic components.

58 **Chiplet signal and power integrity (SI/PI)**
Studying distortion, electromagnetic coupling, and power-delivery noise across multi-chip packaging interconnects.

59 **Reversible computing**
Investigating computational architectures that reduce logical information erasure and associated fundamental energy costs.

TOPICS 60–66

Domain 05 | Energy, thermal physics, and biophysics

Wireless transfer, power-grid protection, energy storage, fusion, thermal transport, and molecular systems.

Energy and materials research studies theoretical performance limits and design trade-offs. Predicted efficiencies, cycle lifetimes, or power outputs are not treated as measured results without experimental verification.

60 **High-efficiency wireless power transfer**
Researching coil and resonator designs that improve energy transfer and tolerance to misalignment.

61 **High-voltage direct-current (HVDC) grid protection**
Studying fast fault-current interruption, switching transients, and low-loss operation in high-voltage networks.

62 **All-solid-state lithium batteries**
Investigating ion transport, interface stress, dendrite formation, charging rate, cycle life, and safety constraints.

63 **Fusion power with net electricity production**
Researching plasma stability, confinement, heating, and whole-plant power balance without relying on superconducting magnets as a design premise.

64 **Nanogap thermal diodes**
Studying directional thermal radiation and electromagnetic transport across extremely small gaps.

65 **Gaussian–T^3–Möbius thermal physics and FPUT heat transport**
Investigating nonlinear energy sharing and the microscopic emergence or limits of heat conduction.

66 **Quantum biophysics**
Exploring how coherence, environmental noise, diffusion, and topological structure influence energy transfer in biological molecular systems.

HOW TO PRESENT THE RESEARCH

Portfolio synthesis & audiences

One research program, three central questions, and many independent technical tracks.

A concise academic introduction

Mr.K conducts independent theoretical and computational research connecting general relativity, quantum mechanics, topological geometry, electromagnetism, and mathematical analysis. The core program examines the structure of spacetime, the controlled preparation of coherent quantum states in complex systems, and nonequilibrium pathways for energy transfer. Related investigations extend across pure mathematics, statistical learning, quantum information, photonics, semiconductors, power engineering, thermal physics, and biophysics.

A concise general-audience introduction

The research asks three questions: What is the underlying mathematical structure of the universe? Can quantum states of large physical systems be deliberately controlled? Can changes between physical states be used to direct energy in new ways? These questions guide a wider set of 66 theoretical and engineering research topics, from cosmology and mathematics to quantum computers, batteries, and photonic devices.

Research portfolio rather than a publication count

The number 66 refers to distinct classified subjects. It must not be described as 66 independently published peer-reviewed papers, 66 solved scientific problems, or 66 experimentally validated devices. Some themes appear within a larger integrated manuscript, others have dedicated long manuscripts, and still others are exploratory or computational subprograms.

Standards of evidence

The status of each scientific claim must be judged at its own level: formal proof within stated assumptions, numerical evidence for a computational model, theoretical extrapolation, or physical measurement. Especially for open mathematical conjectures, tests on finite cases and proofs for restricted domains cannot be promoted to universal theorems. For physical devices, idealized 100% efficiency, vanishing loss, or divergent response in a mathematical limit does not establish real-world performance.

Public communication rule

Describe research questions, mathematical methods, and intended application domains confidently; describe proof strength, numerical validation, and experimental status precisely. Avoid representing proposed cosmological histories, macroscopic mass elimination, or unlimited energy production as experimentally established facts.

RELEASE NOTES

Public disclosure, scope & source note

A conservative research summary that can be shared without implementation-level material.

Deliberately omitted

• Non-public circuit and component designs, source configurations, dimensions, manufacturing parameters, and assembly procedures.

• Exact operating phases, timing programs, resonant settings, proprietary calibration targets, device optimization values, and physical material input datasets.

• Unpublished original proofs, complete derivation chains, private algorithms, internal repositories, code archives, and simulation input files.

• Identifying personal information, direct contact information, manuscript submission identifiers, and private institutional or administrative records.

Interpretive status

This document reflects the available project descriptions and accessible research-manuscript context as of 12 October 2026. The inventory is designed to be comprehensive within the recorded scope, but it is not a forensic certification that every historical conversation, unindexed note, or subordinate manuscript has been recovered. It neither independently audits the scientific correctness of all full-length source manuscripts nor asserts peer-reviewed acceptance.

Intended use

Suitable uses include a private introduction to researchers, a preliminary collaboration portfolio, a non-confidential research-domain map, and a general public overview. Technical evaluation, due diligence, grant applications, or publication submissions should cite the appropriate individual manuscript and distinguish tested results from open claims.

Three flagship manuscripts. Sixty-six research subjects. One public research map — with theoretical ambitions separated from experimentally established results.

Mr.K | Independent theoretical and computational research | Public release, October 2026