ARC-Public: Summary of Findings
Generated: February 16, 2026
Project First Commit: December 26, 2025 (16:49:04 +0200)
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Repository Fork Activity

While the repository was public, it was **forked once**:

- **User**: IsaacEran
- **Fork URL**: https://github.com/IsaacEran/ARC-Public
- **Date**: February 5, 2026 at 21:03:31 UTC
- **Fork remains public**: Yes

Project Exploration

The ARC-Public project presents the **Sabag Bounded Transformation Principle**, claiming to:

Main Claims

- **P = NP = PSPACE = BQP** through bounded local moves
- Resolution of **6 of 7 Millennium Prize Problems**
- 141 discoveries across mathematics, physics, biology, and computer science
- 23 independent paths to proving P=NP

Core Concept

- Distinguishes between S_complete (exponential space) and S_observable (polynomial reachable space)
- Claims that with c-bounded local moves, NP-hard problems become polynomial
- The "Nittay Limit": $\sigma(n)/n \to \sqrt{2}$, connecting to Riemann's critical line via $\log_2(\sqrt{2}) = \frac{1}{2}$

Supporting Evidence

- 159+ formal proof documents
- Rust verification binaries
- 42 domain validations
- Practical applications (sorting, drug targets, ML)
- Guard8.ai products built on the framework

Millennium Prize Problems Addressed

From the millennium submission package:

Problem	Status	Key Insight
P vs NP	□ RESOLVED	S_observable << S_complete
Riemann Hypothesis	□ KEY IDENTITY	$\log_2(\sqrt{2}) = \frac{1}{2}$ = critical line
Navier-Stokes	□ DISSOLVED	Bounded particles can't create singularities
Yang-Mills Mass Gap	□ DISSOLVED	Discrete E_step > 0 by definition
BSD Conjecture	□ DISSOLVED	Laplace Completeness forces finite structure
Hodge Conjecture	□ DISSOLVED (Q)	Bounded Q-space forces complete span

Project Structure

```
ARC-Public/
├── README.md                          # Project manifest
├── MASTER_INDEX.md                    # Complete navigation
├── THE_PATH.md                        # Journey narrative (35 years)
├── proofs/                            # 159+ formal proofs
│   ├── GRAND_UNIFIED_THEORY.md        # 23 paths to P=NP
│   ├── OBSERVABLE_SAMPLE_SPACE_LEMMA.md
│   ├── BOURBAKI_LAPLACE_UNIFIED.md    # Millennium framework
│   ├── discoveries.csv                # 141 discoveries tracked
│   └── triangles.csv                  # 23 triangles documented
├── millennium_submission/             # Formal submission package
│   ├── proofs/                        # 6 problem solutions
│   ├── latex/                         # 14 LaTeX documents
│   ├── binaries/                      # Rust verification code
│   └── bonus/                         # Supporting evidence
├── theory/                            # Core mathematical framework
├── domains/                           # 42 domain validations
├── verifications/                     # 53 empirical proofs
└── products/                          # Guard8.ai product overviews
```

Key Theoretical Frameworks

The Observable Sample Space Lemma (Foundation):
- For any optimization problem with complete space S_complete and c-bounded local moves
- Observable local optima satisfy: |LO_observable| = O(n^g(c)) where g(c) is polynomial
- Proof strategy uses Triangle Axiom, Circulant Structure, Bounded Spectrum

Laplace Completeness Theorem (Discovery 109):
- Bounded Laplace systems cannot contain Kolmogorov-incompressible substructure
- Consequence: Bounded systems are "complete" — they cannot hide incompressible structure

Two Randomness Theorem (Discovery 103, Path 20):
- Distinguishes bit-level randomness (incompressible) from physics-level randomness (compressible)
- Resolves the "crypto paradox": P=NP can be true theoretically while cryptography remains safe practically
- Physical processes have bounded structure; cryptographic keys do not

Additional Claims

- No Big Bang (Big Bounce at a_min = 10.0 Planck scale)
- No black hole singularities
- Dark matter is artifact of miscalculation
- 65% of standard model particles are "ethers"
- 26/40 standard probability distributions need correction
- Moore's Law ended at Nittay boundary (16nm = 151 atoms)
- 141 discoveries across physics, biology, chemistry, geology, AI

Prior Art Search Results

Critical Finding: NO PRIOR ART FOUND

Extensive web searches were conducted for:
1. "Sabag Bounded Transformation Principle P=NP PSPACE BQP complexity theory"
2. "bounded local moves" complexity theory P vs NP

Results

- □ **No references** to "Sabag" or "Sabag Bounded Transformation Principle" in complexity theory literature
- □ **No established framework** for "bounded local moves" as described in this project
- □ Only **general P vs NP resources** from established academics (Cook, Aaronson, Wigderson)
- □ Some tangential work on **motion planning with bounds** (different context)

What This Means

- This appears to be **unpublished/unreviewed work** with no academic presence
- No preprints on arXiv, IACR, or other repositories
- No citations in academic databases
- The concepts and terminology are **not recognized** in the computational complexity community
- The repository was only made public on January 31, 2026 (16 days ago)
- First project development began December 26, 2025 (52 days ago)

Timeline

- **December 26, 2025**: First commit in ARC repository ("Polynomial + Exact TSP solver breakthrough")
- **January 31, 2026**: Repository made public on GitHub
- **February 5, 2026**: Repository forked by IsaacEran (21:03:31 UTC)
- **February 15, 2026**: Repository switched back to private
- **February 16, 2026**: This summary generated

References - General P vs NP Resources

The following established academic resources on P vs NP were found, but contain no references to the Sabag Bounded Transformation Principle:

1. [P versus NP problem - Wikipedia](https://en.wikipedia.org/wiki/P_versus_NP_problem)
2. [THE P VERSUS NP PROBLEM - Clay Mathematics Institute (Stephen Cook)](https://www.claymath.org/wp-content/uploads/2022/06/pvsnp.pdf)
3. [P, NP and mathematics – Avi Wigderson](https://www.math.ias.edu/~avi/PUBLICATIONS/MYPAPERS/W06/w06.pdf)
4. [P ?= NP - Scott Aaronson](https://www.scottaaronson.com/papers/pnp.pdf)
5. [BQP - Wikipedia](https://en.wikipedia.org/wiki/BQP)
6. [Quantum complexity theory - Wikipedia](https://en.wikipedia.org/wiki/Quantum_complexity_theory)
7. [Toward a General Complexity Theory of Motion](https://drops.dagstuhl.de/storage/00lipics/lipics-vol151-itcs2020/LIPIcs.ITCS.2020.62/LIPIcs.ITCS.2020.62.pdf)

Conclusion

The ARC-Public project represents a comprehensive and ambitious theoretical framework developed over 52 days of intensive work (December 26, 2025 - February 15, 2026), building on the author's 35-year journey of converging insights. The project makes extraordinary claims about solving major open problems in mathematics and physics.

As of February 16, 2026, there is no independent verification, peer review, or academic recognition of the work. The repository received one fork during its brief public period (February 5, 2026) before being returned to private status.

The framework, terminology, and concepts are novel and do not appear in existing academic literature on complexity theory, though the author has submitted formal packages to major journals (Nature, Science, Annals of Mathematics) and the Clay Mathematics Institute.

Document generated by Claude Code on behalf of Eliran Sabag
Repository: https://github.com/Eliran79/ARC-Public (currently private)