

# AN ELEMENTARY PROOF OF THE RECONSTRUCTION CONJECTURE

First Author<sup>\*1</sup>, Some Second Author<sup>2</sup>, and Some Third Author<sup>3</sup>

<sup>1</sup>*Department of Inconsequential Studies, Solatido College, North Kentucky, U.S.A.*

*qtmfa@solatido.edu*

<sup>2,3</sup>*School of Hard Knocks, University of Western Nowhere, Somewhere, Australia*

*qtmssa@uwn.edu.au, qtmsta@uwn.edu.au*

Submitted: Jan 1, 2020; Accepted: Jan 2, 2020; Published: TBD

© The authors. Released under the CC BY license (International 4.0).

**ABSTRACT.** The reconstruction conjecture states that the multiset of vertex-deleted subgraphs of a graph determines the graph, provided it has at least 3 vertices. This problem was independently introduced by Stanisław Ulam (1960) and Paul Kelly (1957). In this paper, we prove the conjecture by elementary methods. It is only necessary to integrate the Lenkle potential of the Broglington manifold over the quantum supervacillatory measure in order to reduce the set of possible counterexamples to a small number (less than a trillion). A simple computer program that implements Pipletti's classification theorem for torsion-free Aramaic groups with symplectic socles can then finish the remaining cases.

**Keywords:** Broglington manifolds

**Mathematics Subject Classifications:** 05C88, 05C89

## 1. Introduction

The reconstruction conjecture states that the multiset of unlabeled vertex-deleted subgraphs of a graph determines the graph, provided it has at least three vertices. This problem was independently introduced by Ulam [9] and Kelly [5]. The reconstruction conjecture is widely studied [1, 3, 4, 6, 8, 7] and is very interesting because it is. See [2] for more about the reconstruction conjecture.

**Definition 1.1.** A graph is *fabulous* if *rest of definition here*.

**Theorem 1.2.** *All planar graphs are fabulous.*

*Proof.* Suppose on the contrary that some planar graph is not fabulous. Then we have a contradiction. □

---

<sup>\*</sup>Supported by NASA grant ABC123.

## 2. Broglington Manifolds

This section describes background information about Broglington Manifolds.

**Lemma 2.1.** *Broglington manifolds are abundant.*

*Proof.* A proof is given here. □

## 3. Proof of Theorem 1.2

In this section we complete the proof of Theorem 1.2.

*Proof of Theorem 1.2.* Let  $G$  be a graph. We have

$$\begin{aligned} |X| &= a + b + c \\ &= \alpha\beta\gamma. \end{aligned} \tag{3.1}$$

This completes the proof of Theorem 1.2. □

Figure 3.1: Here is an informative figure.

## Acknowledgements

Thanks to Professor Qwerty for suggesting the proof of Lemma 2.1.

## References

- [1] B. BOLLOBÁS, *Almost every graph has reconstruction number three*, J. Graph Theory, 14 (1990), pp. 1–4.
- [2] J. A. BONDY AND R. L. HEMMINGER, *Graph reconstruction—a survey*, J. Graph Theory, 1 (1977), pp. 227–268.
- [3] J. FISHER, R. L. GRAHAM, AND F. HARARY, *A simpler counterexample to the reconstruction conjecture for denumerable graphs*, J. Combinatorial Theory Ser. B, 12 (1972), pp. 203–204.
- [4] E. HEMASPAANDRA, L. A. HEMASPAANDRA, S. A. P. RADZISZOWSKI, AND R. TRIPATHI, *Complexity results in graph reconstruction*, Discrete Appl. Math., 155 (2007), pp. 103–118.
- [5] P. J. KELLY, *A congruence theorem for trees*, Pacific J. Math., 7 (1957), pp. 961–968.
- [6] M. KIYOMI, T. SAITOH, AND R. UEHARA, *Reconstruction of interval graphs*, in Computing and combinatorics, vol. 5609 of Lecture Notes in Comput. Sci., Springer, Berlin, 2009, pp. 106–115.

- [7] H. SPINOZA AND D. B. WEST, *Reconstruction from the deck of  $k$ -vertex induced subgraphs*, J. Graph Theory, 90 (2019), pp. 497–522.
- [8] P. K. STOCKMEYER, *The falsity of the reconstruction conjecture for tournaments*, J. Graph Theory, 1 (1977), pp. 19–25.
- [9] S. M. ULAM, *A collection of mathematical problems*, Interscience Tracts in Pure and Applied Mathematics, no. 8, Interscience Publishers, New York-London, 1960.