$3n + 1$ Problem - Abstract

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The $3n + 1$ problem (also known as the Collatz Conjecture, Ulam's Conjecture, the Syracuse Problem, etc.) was proposed in the 1930s and can be stated through iterations of the function:

$$C(n) = \begin{cases} \dfrac{n}{2} & \text{if } n \text{ is even} \\ 3n + 1 & \text{if } n \text{ is odd} \end{cases}$$

The conjecture states that no matter what natural number is chosen there is a k such that $C^{(k)}(n) = 1$ for some $k \geq 1$.

This question is very easy to state but has remained unsolved. We will examine some behavior of the function as well as state some results on this easy-to-state-but-difficult-to-prove problem.