

# KINEMATICS

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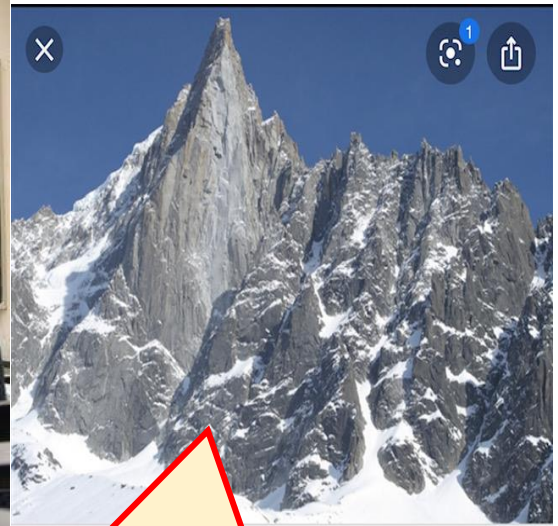
[jpcise@austinctc.edu](mailto:jpcise@austinctc.edu) & New York Times, Sept. 7, 2019 by Dylan Loeb McClain, Dedicated to first Everest climbers: Hillary & Tenzing

## Steven Gubser, a Bright Star in the Physics Universe, Dies at 47

He did groundbreaking work toward finding a “theory of everything.” He died in an Alpine rock-climbing accident



Steven Gubser teaching at Princeton in 2010. He sought to make physics accessible to both students and the general public, writing “The Little Book of String Theory” and “The Little Book of Black Holes



Comb Needle: Near Chamonix Mt Blanc France

Steven Gubser, a Princeton theoretical physicist who did groundbreaking work in trying to unite the two great fields of physics — quantum mechanics and general relativity — as part of a broad effort in the scientific community to devise “a theory of everything,” died on Aug. 3 in a rock-climbing accident in the French Alps. He was 47.

Princeton University, where he was a professor, said **Dr. Gubser was in Chamonix climbing Comb Needle, a peak near Mont Blanc, the tallest mountain in the Alps, when his rope broke. He fell more than 800 feet to his death.**

He, like his father before him, was an experienced rock climber who had scaled Comb Needle at least once before. Dr. Gubser was one of the most accomplished physicists of his generation, making an impact early on. While still a teenager he became the first American to win an international physics competition for high school students. As a student at Princeton he won the highest American award for undergraduate research. And as a young scientist he was cited in Europe as one of the most outstanding theoretical physicists under the age of 35. Dr. Gubser’s specialty was string theory, which many physicists believe could solve a fundamental problem in physics: the disconnect between quantum physics and general relativity, the theory put forward by Einstein. What’s called the **Standard Model, one of the signature creations of quantum physics, is very good at explaining the workings of three of the four known forces in the universe: electromagnetism; the strong, or nuclear force, that binds together the nuclei of atoms; and the weak force, which is manifest in radioactive decay. But the Standard Model does not account for gravity; Einstein’s theory does.**

**INTRODUCTION:** This very unfortunate climbing accident claimed the life of a upcoming great physicist. Dr. Gubser fell 800 feet from the Comb Needle due to his rope broke.

**QUESTIONS:** (a) Find Dr. Gubser final speed (in ft./s.) after falling 800 ft. ?, (b) Convert ft./s. to mph?, (c) Find fall t?

**HINTS:**  $a = g = -32 \text{ ft./s.}^2$ ,  $y = -800 \text{ ft.}$  (down is negative),  $v^2 = v_0^2 = 2 a x$ ,  $v = v_0 + a t$ ,  $88 \text{ ft./s.} = 60 \text{ mph}$

**ANSWERS:** (a)  $v = \sim 226.3 \text{ ft./s.}$ , (b)  $\sim 154.3 \text{ mph}$ , (c)  $t = \sim 7.1 \text{ s.}$