

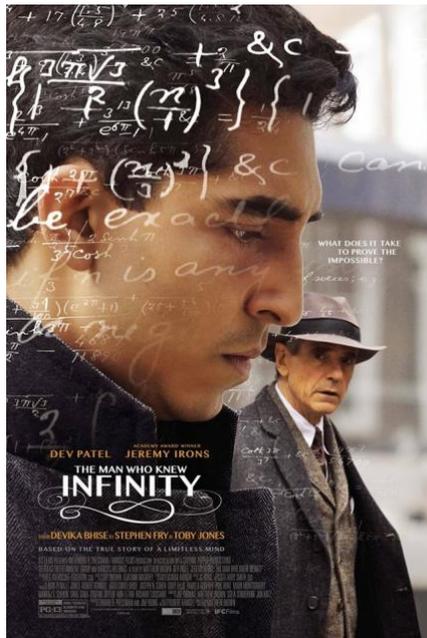
# VISITING SCHOLAR PROGRAM

The PHI BETA KAPPA Society

## Ken Ono, Ph.D.

Thomas Jefferson Professor of Mathematics, University of Virginia  
Vice President, American Mathematical Society  
Chair of Mathematics, American Association for the Advancement of Science

**Ken Ono** is a research mathematician who has a strong interest in issues related to the college experience. He is known for his research in mathematics, and his work in television and film. He was the Associate Producer of the Hollywood film “The Man Who Knew Infinity” about the self-trained Indian mathematical genius Srinivasa Ramanujan, and he starred in an episode of **Star Talk** hosted by Neil deGrasse Tyson.



### Public Lecture Option 1:

**Title:** Why does Ramanujan, “The Man Who Knew Infinity,” matter?

*“Dear Sir...I beg to introduce myself to you as a clerk... of the Port Trust Office at Madras... I have been employing the spare time at my disposal to work at Mathematics...I have not trodden through the conventional regular course...but I am striking out a new path...”*

What followed in the letter were astonishing mathematical formulas, so otherworldly the letter's recipient could not help but believe they were true. Written in 1913, it has taken mankind one century to understand their meaning; along the way, the pursuit has led to solutions of ancient mathematical mysteries, breakthroughs in modern physics, and ideas which help power the internet.

A major motion picture based on the life of the letter's author, *THE MAN WHO KNEW INFINITY*, starring Dev Patel and Jeremy Irons, was released in 2016 (Ken Ono is an Associate Producer of the film). The mysterious "clerk of the Port Trust Office of Madras" has been in the air a lot recently. News stories about black hole physics and discoveries in mathematics often center on his work.

With this letter, Srinivasa Ramanujan—impoverished Hindu college dropout, self-taught in mathematics, reaching for worlds beyond the shores of India—introduced himself not only to G.H. Hardy (superstar British mathematician), but to the history of human thought.

After absorbing the surprising equations in the letter, Ramanujan was invited to study in England, an extraordinary offer for an Indian under oppressive colonial rule. There he innovated vast tracts of mathematics, before returning to India in fragile health. Tragically, he died at 32 from a misdiagnosed illness, leaving enigmatic notebooks that drive cutting-edge research to this day.

To scientists, Ramanujan symbolizes pure inspiration, the sort of creative flights more often associated with musicians or artists. To contemporary India, he is a national hero, a household name. Furthermore, the story of Ramanujan provides a modern archetype, the rise from humble conditions to the world's center-stage that modern-day India itself exemplifies. But why does Ramanujan matter today?

There is human interest. "My association with him is the one romantic incident in my life," Hardy wrote after Ramanujan's death. At the heart of *THE MAN WHO KNEW INFINITY* is the awkward friendship between the self-taught, pious Ramanujan, and the rigorous, avowed atheist Hardy. This unlikely alliance is itself of mythological flavor. It was a miracle that Ramanujan's letter made its way to Hardy's desk from India. That Hardy worked through the strange letter, recognized the author's brilliance, and took Ramanujan under his wing, is also hard to imagine, for Ramanujan was an unlikely student. So enraptured was he with his continual discoveries that he flunked out of college twice. ("It is the worst instance that I know of the damage that can be done by an inelastic educational system," commented Hardy).

Moreover, the story has an important moral in today's society. Ramanujan matters because he represents endless curiosity and untapped potential, which we all have to believe in to proceed in the sciences. Science usually advances on the work of thousands, over generations, fine-tuning and extending the scope of understanding. But from time to time, creative fireballs like Ramanujan burst onto the scene propelling

human thought forward. Yet what if Ramanujan had not reached out to, or been taken seriously by Hardy? The loss of scientific understanding is something our modern world could not absorb. He matters because science matters: curiosity and creativity drive scientific inquiry.

Echoing Hardy's criticism of the "inelastic" nature of Ramanujan's formal schooling, today's educators are flooded with a litany of complaints—disaffected students, teacher burn-out, over-testing, obsolete technology, inadequate funding, to name a few. How would we recognize and nurture an outlier like Ramanujan today, as Hardy did in his time? Like SETI, constantly listening for signals of alien intelligence, we as a global civilization must scan our cities, towns, and villages for the next Ramanujans.

### **Public Lecture Option 2:**

**Title:** Live mathematically, but not by the numbers

Ten years ago some scientists published a paper offering a mathematical formula for happiness. Does anyone really believe that one can live mathematically in a way that guarantees happiness? In the era of big data, one can easily get carried away with the illusion that "living by the numbers" is a good rule of thumb. However, what good is the mindless pursuit of grades, strong test scores, and high rankings? Ken Ono presents how his amazing mentors changed his point of view on life's challenges. He explains how one's attempt to live mathematically, but not by the numbers, can lead to happiness.

**Classroom Sessions.** Ono offers several possible classroom topics.

**Option 1)** For schools which select "Why does Ramanujan, The Man Who Knew Infinity, matter" as the public lecture (which includes film clips), Ono can offer a modified version of "Live mathematically, but not by the numbers".

**Option 2)** As Ono is a research mathematician, he can offer topics which are of interest to STEM students (e.g. Nature of Evidence in Mathematics, Story of Prime Numbers, Hot topics in Number Theory).

**Option 3)** Ono can talk about the production of Hollywood biopics. In addition to his work on "The Man Who Knew Infinity", he is presently cultivating two further biopics.