

PRESS NOTE

A Proof for the Riemann Hypothesis (RH) - A millennium problem In mathematics which was waiting for proof for the last 161 years.

Developed by Dr. Kumar Eswaran

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Genesis of this Problem (RH)

The problem of RH arose from the work of the great mathematician Carl Friedrich Gauss (1777-1855) who had written down a formula which can be used to approximately predict the number of prime numbers below any given number. Georg Friedrich Bernhard Riemann (1826-1866) improved the formula by using entirely original methods involving the calculus of functions of a complex variable. It was necessary for him to introduce a certain function called the zeta function, which is a function of a complex variable. This zeta function becomes zero at all the negative even integers (called the trivial zeros) but, more importantly, it also becomes zero at other points (called the nontrivial zeros). The improved formula that Riemann obtained involved the zeros of the zeta function. The famous Riemann Hypothesis is Riemann's conjecture that all the non-trivial zeros of the zeta function occur on a single straight line – the so called critical line– of the complex plane.

This Riemann Hypothesis remained unproven for nearly 161 years and it is considered as **Number One** out of the 10 top unsolved mathematical problems, as stated by American mathematician [Stephen Smale](#). In the year 2000 it was designated as a millennium problem, one of the seven mathematical problems selected by the Clay Mathematics Institute of Cambridge, Mass, USA and announced a reward of \$1 million dollars for its solution. In Encyclopedia Britannica it is stated that “A proof of the Riemann hypothesis would have far-reaching consequences for [number theory](#) and for the use of primes in [cryptography](#)” (<https://www.britannica.com/science/Riemann-hypothesis>).

The management of Sreenidhi Institute of Science and Technology is very pleased to announce that a duly constituted Expert Committee of scientists have determined after detailed and careful perusal of the comments of competent reviewers that one of our professors, Dr. Kumar Eswaran has proved the “The Riemann Hypothesis”. Proof or disproof of the hypothesis has eluded the efforts of the most famous mathematicians for the past 161 years. The importance of the Riemann Hypothesis (RH) is well-known to mathematicians and it is also recognized that the proof of RH would automatically lead to the proof of numerous theorems which are dependent on the truth of this hypothesis.

Dr. Kumar Eswaran's proof of RH

Dr. Kumar Eswaran took off from the work of J.E. Littlewood (1885-1977) and showed that the RH could be resolved if the analytical behavior of a certain specially chosen function of a complex variable can be determined. The study of this special function led to a study of the asymptotic behavior of a particular sequence. It was shown that RH is proved if it can be demonstrated that this particular sequence behaves asymptotically like a random walk (like the tosses of a coin). By using the arithmetic properties of numbers, Dr. Eswaran could then prove certain crucial theorems to demonstrate that this requirement is indeed met. An application of a well-known relationship called the Law of the iterated logarithm (due to A.Y. Khinchine (1894-1959) and A.N. Kolmogorov (1903-1987)) then finally proved that the nontrivial zeros of the zeta function must all lie on the critical line. **The RH was thus proved.**

Conclusion of National level committee constituted by Sreenidhi With Dr T. Ramasami, Ph.D. (Leeds), Padma Bhushan, as Advisor (Former Secretary of Department of Science and Tech., Govt. India) :

Dr. Kumar Eswaran, placed his proof on the internet almost 5 years ago and there were thousands of downloads. He gave many lectures during the period 2018 to 2019 outlining his methods. These lectures were well received. The Expert Committee was formed in January 2020 which looked into the proof. The committee invited more than 1,200 mathematicians to participate in an open review. The review was open in the sense that the referees had to be willing to have their names and institutional affiliations openly revealed, so that nothing is done anonymously, nothing can be said that would not be openly available for all other experts to see. The Committee could not think of a fairer way to get the proposed proof assessed. The Expert Committee then examined the comments of the reviewers and the responses of the author. ***In their final meeting held on 16th May 2021, the Committee concluded that Dr. Kumar Eswaran's proof of the Riemann Hypothesis is correct.***

The Expert Committee had also ruled that we should publish the proof, the referees' comments, and the author's responses in their entirety, without any redactions in the form of an E-Book which should be made available to the public at large and then followed, a few months later, by publishing a monograph printed by a suitable publisher.

The renowned theoretical physicist Richard Feynman (1918-1988) had said that when the cubic equation was first solved by Tartaglia (1500-1557), "the thing was of greatest importance to mathematics in Europe" because, "it showed a modern man could do something no ancient Greek could do, and therefore helped in the renaissance". We similarly pray that this proof by a mathematician of Hyderabad would inspire our esteemed community of mathematicians and their research scholars and revive the tradition of mathematics once laid down by Indian and Arabic mathematicians such as Aryabhata, Bhaskara, Al-Khwarizmi and Omar Khayyam.

Because of the difficult Covid situation, we are releasing the E-Book electronically on to our website for the information of all mathematicians and scientists. All journalists are requested to take cognizance of this and give this event wide publicity.

(Dr K.T. Mahhe)

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