Disproof Of Wiles' Proof

For Fermat's Last Theorem

Chun-Xuan, Jiang
P. O. Box 3924, Beijing 100854, China
jiangchunxuan@sohu. com
and Institute for Basic Research
P. O. Box 1577, Palm Harbor, FL 34682, U.S. A

Abstract

There cannot be number theory of the twentieth century, the Shimura-Taniyama-Weil conjecture (STWC) and the Langlands program (LP) without the Riemann hypothesis (RH). By using RH it is possible to prove five hundred theorems or more including Wiles' theorem of Fermat's last theorem (FLT) which is false, because RH is disproved.

1. Introduction

David Hilbert[1]. For Hilbert, the Reimann Hypothesis became the most important of all his problems, if we are to believe a story often told in mathematical circles: According to German legend, after the death of Barbarossa, the Emperor Frederick I, during a Crusade he was buried in a faraway grave. It was rumored that he was not dead but asleep, and would wake one day to save Germany from disaster, even after five hundred years. Hilbert was once asked, “If you were to revive, like Barbarossa, after five hundred years, what would you do? ” He replied, “I would ask, ‘Has somebody proved the Riemann Hypothesis? ’ ”

Andrè Weil [2]. In an interview for *La Science* in 1979, Weil was asked which theorem he most wished he had proved. He replied that ‘In the past it sometimes occurred to me that if I could prove the Riemann Hypothesis, which was formulated in 1859, I would keep it secret in order to be able to reveal it only on the occasion of its centenary in 1959.’ But despite a concerted effort, nothing gave. ‘Since 1959, I have felt that I am quite far from it; I have gradually given up, not without regret.’ ‘I’d like to see the Riemann Hypothesis settled before I die, but that is unlikely.’

Robert Langlands[3]. A characteristic of the number theory of the twentieth century has been the dominant role played by zeta-functions and L-functions, especially at a conjectural level. The analytic properties of the L-functions associated to an algebraic variety over a number field have been particularly difficult, usually impossible, to determine. But Shimura has studied very deeply certain varieties, which, like the varieties defined by elliptic modular functions, are closely related to algebraic groups. For various reasons it is to be expected that the L-functions associated to these Shimura varieties can be expressed in terms of the L-functions associated to automorphic forms on the group defining the variety and on certain related groups. This in itself is not enough to establish the analytic properties but it is a first step. Shimura, inspired by earlier work of Eichler, has been able to confirm the expectation for some of his varieties, basically those which are curves.

Of the mathematical tools at work in number theory, none is more central than RH. There cannot be number theory of the twentieth century, STWC and LP without RH. The use of RH then leads to many mathematical problems: such as the generalized Riemann conjecture, Artin's conjecture, Weil conjecture, LP, STWC, Birch and Swinnerton-Dyer conjecture, Artin's L-functions, the Hasse-Weil zeta functions, automorphic L-functions, Dirichlet L-functions, Hurwitz zeta functions, quantum chaos and hypothetical Riemann flow, the zeta functions and L-functions of algebraic varieties and other studies. By using RH it is possible to prove five hundred theorems or more including Wiles' theorem of FLT which is false, because RH is disproved.

2. Riemann Hypothesis

In 1859 Riemann defined the zeta function [4]

$$\varsigma(s)=\prod_{p}(1-p^{-s})^{-1}=\sum_{n=1}^{\infty}\frac{1}{n^{s}} \qquad (1)$$

where $s=\sigma+ti,\ i=\sqrt{-1}$, σ and t are real, p ranges over all primes. $\varsigma(s)$ satisfies the functional equation

$$\pi^{-\frac{s}{2}}\Gamma\left(\frac{s}{2}\right)\varsigma(s)=\pi^{-\frac{(1-s)}{2}}\Gamma\left(\frac{1-s}{2}\right)\varsigma(1-s) \qquad (2)$$

From (2) we have

$$\varsigma(ti)\neq 0 \qquad (3)$$

Riemann conjectured that $\varsigma(s)$ has infinitely many zeros in $0\le\sigma\le 1$, called the critical strip. Riemann further made the remarkable conjecture that the zeros of $\varsigma(s)$ in the critical strip all lie on the central line $\sigma=1/2$, a conjecture called the famous Riemann hypothesis (RH). By three methods we disprove RH [5].

3. Langlands Program

The Langlands program, first formulated by Robert Langlands in his well-known letter to Andaré Weil in 1967, consists of a series of far-reaching conjectures connecting algebraic number theory (Galois representations) and analysis (automorphic forms). In recent years a whole series of impressive results have been obtained in the direction of this program. It suffices to recall the fairly recent proof of Fermat's Last Theorem and the verification of the Taniyama-Weil conjecture connecting elliptic curves with modular forms.

What is the most general situation in which we expect the Riemann Hypothesis to hold? The Langlands program is an attempt to understand all L-functions and to relate them to automorphic forms. At the very least a Dirichlet series that is a candidate for RH must have an Euler product and a functional equation of the right shape. Selberg has given a set of four precise axioms which are believed to characterize the L-functions for which RH holds [6]. LP is a generalization of RH which is false.

4. Shimura-Taniyama-Weil Conjecture

The STWC is an elliptic curve, the L-function associated to an elliptic curve E: $y^2=x^3+Ax+B$, where A and B are integers. The associated L-function, called the Hasse- Weil L-function, is

$$L_E(s)=\sum_{n=1}^{\infty}\frac{a(n)/n^{1/2}}{n^s}=\prod_{p\nmid N}\left(1-\frac{a(p)/p^{1/2}}{p^s}+\frac{1}{p^{2s}}\right)^{-1}\times\prod_{p|N}\left(1-\frac{a(p)/p^{1/2}}{p^s}\right)^{-1}, \tag{4}$$

where N is the conductor of the curve. The coefficients a_n are constructed easily from a_p for prime p; in turn the a_p are given by $a_p=p-N_p$, where N_p is the number of solutions of E when considered modulo p. The work of Wiles and others proved that these L-functions are associated to modular forms of weight 2. This modularity implies the functional equation

$$\xi_E(s) := (2\pi/\sqrt{N})^{-s}\Gamma(s+1/2)L_E(s) = \xi_E(1-s)\,. \qquad (5)$$

It is believe that all of the complex zeros of $L_E(s)$ are on the 1/2 line [6].
The STWC is a special example of LP. It is at the heart of Wiles' proof of FLT which is a generalization of RH and false.

5. Fermat's Last Theorem (I)

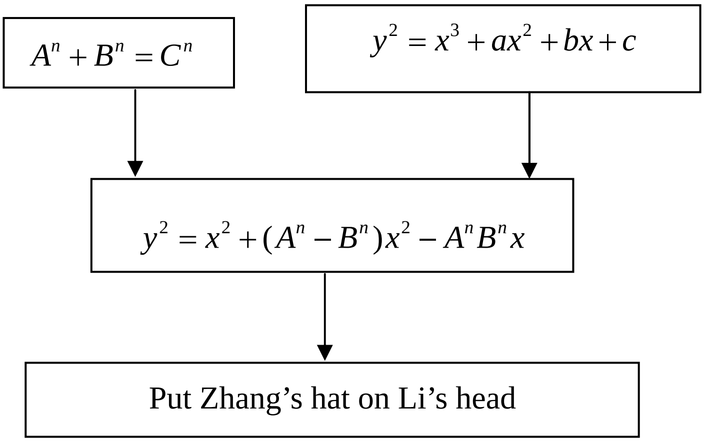

Fig. 1. Put Zhang's hat on Li's head

Figure 1 shows the following equations (6), (7) and (8).
Fermat's last theorem has the form

$$A^n + B^n = C^n \qquad (6)$$

where n is greater than 2, $ABC \neq 0$.
There are on integer solutions to (6).
Elliptic curve has the form

$$y^2 = x^3 + ax^2 + bx + c\,, \qquad (7)$$

where a, b and c are integers.
Frey [7] puts the Fermat's last theorem hat on the elliptic curve head to have

the form

$$y^2 = x^3 + (A^n - B^n)x^2 - A^n B^n x, \quad (8)$$

where $a = A^n - B^n, b = -A^n B^n, c = 0$.

The proof of Fermat's last theorem (6) converts into studying an elliptic curve (8). Equation (8) is an elliptic curve, but it is not Fermat's equation. By false LP and in magic way Ribet proves that equation (8) implies Fermat's last theorem which is false [8].

Figure 2 shows Wiles' proof of FLT.

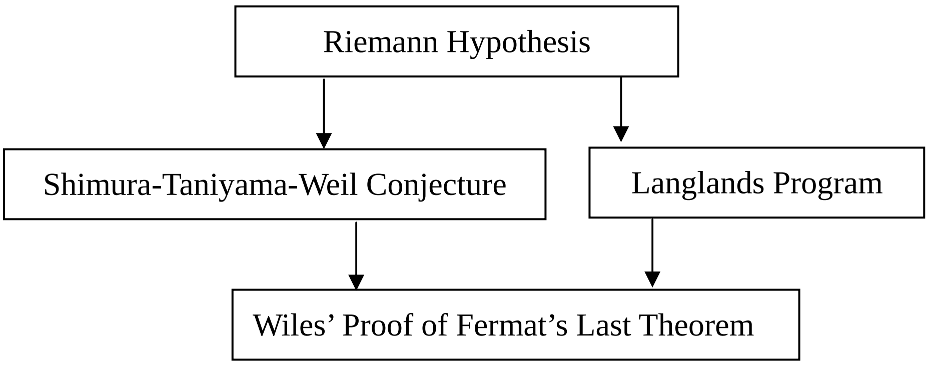

Fig. 2. A relation between RH and Wiles' proof of FLT

Wiles studies only elliptic curve, but he does not discuss FLT. From Fig.2 we conclude that Wiles' proof is false [9].

6. Fermat's Last Theorem (Ⅱ)

After Wiles announced that he proved Fermet's Last Theorem (FLT) on June 23, 1993, trusting that his proof was a valid proof but only a 2nd proof of FLT, I made efforts to argue the following: a) I proved FLT on Oct. 25, 1991, long before Wiles' proof; b) I sent over 600 copies of my preprints in early 1992 to numerous worldwide mathematics institutions and mathematicians, including

Princeton University; c) My proof of FLT was first published in Chinese in March 1992 (Jiang Chun-xuan, Fermat's Last Theorem has been proved, Potential Science, 2, 17-20 (1992)); d) My proof of FLT was published in English in 1994 (Jiang Chun-xuan, Algebras, Groups and Geometries, 11, 371-377 (1994)) before Wiles made his final announcement that he has eventually proved FLT in 1995; e) After learning about Wiles' announcement, I sent a few hundred copies preprint of my proof of FLT again to numerous worldwide mathematics institutions and mathematicians, including Princeton University; f) By using about fifty theorems I prove FLT [10, 11].

In 1998 I disprove RH [12] which means that Wiles' proof is false. I have been waiting a long time, hoping that these errors of Wiles' "proof" will be identified and pointed out by other mathematicians in China or abroad, rather than me. As it now seems no other mathematician is willing to point them out, even if identified by them. I feel it is my duty to the world mathematician community to point them out and prove that Wiles' "proof" is false.

7. A Letter

Dear Chenny,

Prof. Jiang paper "Disproofs of Riemann's Hypothesis" is available at the top of the home page of our Institute http://www.i-b-r.org or in its page of Scientific Works http://www. i-b-r.org/ir00022.htm or directly from the pdf file http://www.i-b-r.org/ir00022.htm Riemann. pdf. The article is in press in Algebras, Groups and Geometries, Vol. 21, 2004, the first issue of March that will be released in May 2004.

I believe that this is a simply historical contribution that provides great honors for China. We are propagating the paper as widely as we can. On your side, please do the same by sending the information on the paper to all important mathematicians around the world via e-messages. Also, as Prof. Jiang correctly indicates in the paper, Riemann's hypothesis has been assumed at the foundation of numerous mathematical conjectures that are now all disproved and replaced by Prof. Jiang proved structure. This situation implies the existence of great academic interests on Riemann’s hypothesis and, consequently, great political opposition to Prof. Jiang lifelong work. To help him, it is important that selected elements of the Chinese Government intervene to have Prof. Jiang invested at important mathematical conferences.

If there is anything I can do, please do not hesitate to let me know.

Yours, Truly

Ruggero Maria Santilli

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