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5 **Abstract**

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7 **Index terms—**

8 **1 INTRODUCTION**

9 Since the beginning of the 1900s, we have transformed our view of the Universe. We learned that our galaxy is  
10 just one of many, that galaxies are racing away from each other, and that the universe's expansion is accelerating.

11 These discoveries depended on an important finding made by Henrietta Leavitt, an American astronomer. [1]

12 In 1929, Edwin Hubble announced that almost all galaxies appeared to be moving away from us. [2][3][4] [5]

13 The velocity of a galaxy could be expressed mathematically as [3]  $(1 - v)^{-1} = \frac{d}{H}$  Where  $v$  is the galaxy's radial

14 outward velocity,  $d$  is the galaxy's distance from Earth, and  $H$  is the constant of proportionality called the Hubble

15 constant. [6] Today some theories have indeed become very complicated, and some have been too simple. But

16 the fundamental ideas aren't that complex. Does the Hubble constant have this very simple relationship? And

17 is the calculation of the age of the Universe so easy? The exact value of the Hubble constant is still somewhat

18 uncertain but is generally believed to be around 65 kilometers per second for every megaparsec in the distance.

19 [6] [7] The Hubble law is in functional studies. [8][9][10][11][12] The first measurement of  $H_0$  from WMAP,  
20 in 2003, was  $72 \pm 5$ . Further results from WMAP were slightly lower: 73 in 2007, 72 in 2009, and 70 in 2011.

21 No problem, though: the error for the SH0ES and WMAP measurements still overlapped in the 72-to-73 range.

22 The most recent result from SH0ES at that time showed a Hubble constant of  $74 \pm 2$ , and WMAP's final result  
23 showed a Hubble constant of  $70 \pm 2$ . [8] The fact that the Hubble expansion rate of the Universe changes over

24 time teaches us that the expansion of the Universe isn't a constant phenomenon. In fact, by measuring how that

25 rate changes over time, we can learn what our Universe is made from: this was precisely how was first discovered

26 dark energy. [15] [16] Entitling his paper "Sorry, Astronomy Fans, The Hubble Constant Isn't A Constant At All

27 Starts With A Bang," Ethan Siegel wrote that if you measure the slope of that line, you get a value, colloquially

28 known as the Hubble constant, still, it isn't a constant at all, as it changes over time.

29 Here's the science behind why. [17] Astronomers have reached a fundamental impasse in their understanding  
30 of the Universe: they cannot agree on how fast it is flying apart. And unless a reasonable explanation can be

31 found for their differing estimates, they may be forced to completely rethink their ideas about time and space.

32 Only new physics can now account for the cosmic conundrum they have uncovered, many believe. [18] "Over the

33 decades, these surprises have included the discovery of dark matter -believed to be made up of as yet undetected

34 particles -whose extra gravitational pull explains why galaxies do not fly apart. In addition, astronomers have

35 also discovered the existence of dark energy, which is accelerating the rate at which the cosmos is expanding.

36 [18] "Those two discoveries were remarkable enough," adds Riess who won his Nobel for his involvement in  
37 the discovery of dark energy. "But now we are facing the fact there may be a third phenomenon that we had

38 overlooked -though we haven't got a clue yet what it might be." [18] "Changing the Hubble constant from 67.4 to

39 73.5 would mean it must have been flying apart faster than previously supposed and so must be younger than its

40 currently accepted age of 13.8bn years," says Mortlock. [18] A Kavli Institute for Theoretical Physics workshop in

41 July 2019 directed attention to the Hubble constant discrepancy. New results showed that it does not appear to

42 depend on the use of any one method, team, or source. Proposed solutions focused on the pre-recombination era.

43 [19] This paper is a summary review of a KITP-UCSB workshop convened to bring together both experimental

44 and theoretical researchers in the field to review and assess the current state of affairs and identify promising

45 next steps for the resolution of this issue. [20][21]

46 The model is well established from decades of research and its Hubble constant prediction is supported by

47 Planck's results, however, measurements indicate the universe is expanding faster than expected. This conflict has

## 5 THE AGE OF THE UNIVERSE IS FLAWED

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48 been growing more perplexing in recent years. ??1][22] "The Hubble constant discrepancy has been increasing,  
49 raising the possibility that we may be missing something interesting in our understanding of the universe,"  
50 said SH0ES team lead Adam Riess at the Johns Hopkins University and Space Telescope Science Institute in  
51 Baltimore. [22] So, either something is wrong with our various measurement techniques or something is wrong  
52 with our theoretical model of how the universe evolves. ?? and distance in the Hubble Law is called the Hubble  
53 constant [9] (it looks like the Planck constant [13]), or more appropriately the Hubble parameter we have a history  
54 of revising it. In recent years the value of the Hubble parameters has been considerably refined, and the current  
55 value given by the WMAO mission is 71 km/s per second. Measurements using a variety of techniques find the  
56 Hubble constant to be about 70 to 76 kilometers per second for every megaparsec of distance (Mpc, about 3.26  
57 million light-years). So, an object one Mpc away will move away from us at 70-76 km/s, an object two Mpc will  
58 move away at 140-152 km/s, and so on.

59 [1] [14] expansion rate in the modern universe than expected, based on how the universe appeared more than  
60 13 billion years ago. These measurements of the early Universe come from the European Space Agency's Planck  
61 satellite. This discrepancy has been identified in scientific papers over the last several years, still, it has been  
62 unclear whether differences in measurement techniques are to blame or whether the difference could result from  
63 unlucky measurements. [24] These most precise Hubble measurements to date bolster the idea that new physics  
64 may be needed to explain the mismatch. [24] "This mismatch has been growing and has now reached a point  
65 that is impossible to dismiss as a fluke. This disparity could not plausibly occur just by chance." [1][25] [26]  
66 Cosmologists have been struggling to understand an apparent tension in their measurements of the present-day  
67 expansion rate of the Universe, known as the Hubble constant. Then in 1998, Purlmutter, Schmidt, and Riess  
68 used observations of very distant galaxies to show that the Universe was not just expanding but accelerating.  
69 [33].

70 London Journal of Research in Science: Natural and Formal The recent study strengthens the case that new  
71 theories may be needed to explain the forces that have shaped the cosmos. [24].

72 Either way, the Hubble constant puzzle indicates something is missing from our picture of the universe.

73 [1] [24] And that was all it short review is about recent scientific research on the Hubble constant.

## 74 2 II. NEW SOLUTION FOR HUBBLE PROBLEM

### 75 3 Hubble Flow

76 Hubble's law must yield a great deal of much more information about the Universe. But it conflicts with the  
77 observations and research above talked. This contradiction is not just in minor details but is very fundamental.  
78 Hubble's law couldn't be formulated perfectly because the Hubble constant (H) is a linear relationship between  
79 the distance and velocity of the receding celestial object on a small scale (1-2 Mpc). The Hubble law was almost  
80 valid in nearby galaxies (700 Mpc) (Figure 2a and Figure 2b). But it is not constant for distant galaxies lying  
81 more than 700 Mpc. Today we can observe 14260 Mpc or 46.5 Gly in radius ??34]. I introduce that the diameter  
82 of the whole Universe is approximately 60000 Mpc, which equals 195.7 billion light years.

83 [35] Of course, at that time Hubble law was a revolutionary scientific discovery. At that time, it was. Even  
84 now, not only Hubble's law (same as Einstein's photoelectric effect [13]) but many phenomena haven't been  
85 explained by classical physics because they are not linear, but cyclical. As seen today, Hubble's law cannot be  
86 accurately determined without the apparent hysteresis of magnetism. Because of this, we carefully handle the  
87 100-year-old theory of Hubble from another point of view in this chapter.

88 Does the problem of Hubble's constant direct us to new physics? Or require a new consideration of an old  
89 unsolved law? Both versions maybe. I think that the reason for Hubble's problem is the unsolved old physical  
90 phenomenon of hysteresis, which has been a struggle for scientists. At first, I solved the problem to open  
91 hysteresis, then used it for solving the Hubble problem, and finally considered its results for different levels, from  
92 quantum mechanics to cosmological phenomena. It was proved to be correct and rational.

93 [35] [37][38][39][40] ??41][42][43].

94 London Journal of Research in Science: Natural and Formal The Hubble Flow (H(x)) is described by the  
95 following formula of the open hysteresis of the electromagnetism [13][35] [37][38][39][40] ??41][42][43] (Figure 2d):

96 ()2

97 Where x is the distance unit in a circular scale.

98 According to the Supreme Theory of Everything, the graph of Hubble Flow shown in red in Figure 2d shows  
99 only the whole structure of the Universe.

## 100 4 Structure of the Universe

101 The understanding of the universe depends on the key factor "Hubble flow". The curve in Figure 2d is a quarter  
102 of a full illustration in the Universe-scale. London Journal of Research in Science: Natural and Formal

## 103 5 The Age of the Universe is Flawed

104 According to the Hubble law? = ??? [45] ? ? ( ) = ?? ? ( ) ?? ? ? ( )

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105 Where is the dimensionless scale factor for  $\dot{a}/a$  ( ) the expanding Universe, is the scale  $a/a_0$  ( ) = 1 factor at  
106 present.

107 **6 ??? = 1**

108 The scale factor  $R$  for a given observed object in the expanding Universe relative to at  $a_0 = 1$  present may be  
109 implied from the  $z$  parameter expression of the redshift. [9] The Hubble parameter has the dimensions of inverse  
110 time, so a Hubble time may be obtained ?

111 **7 III. CONCLUSION**

112 We summarize that:

? We cannot find any constant of Hubble <sup>1</sup>



Figure 1:

113

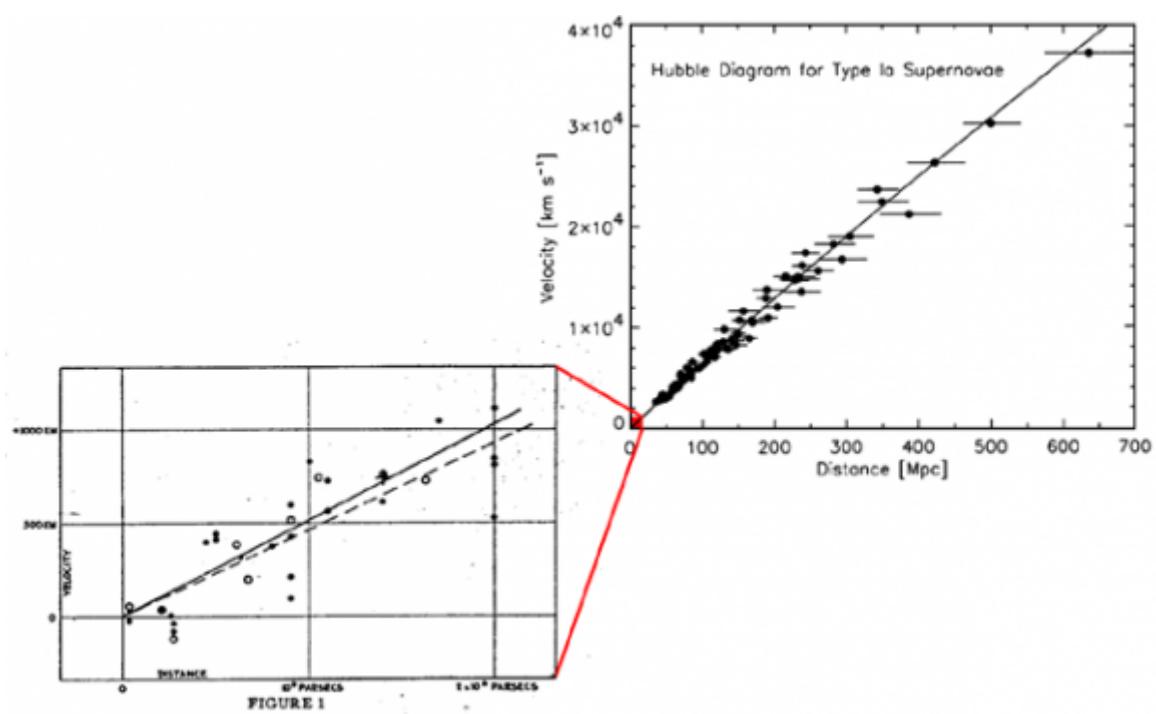
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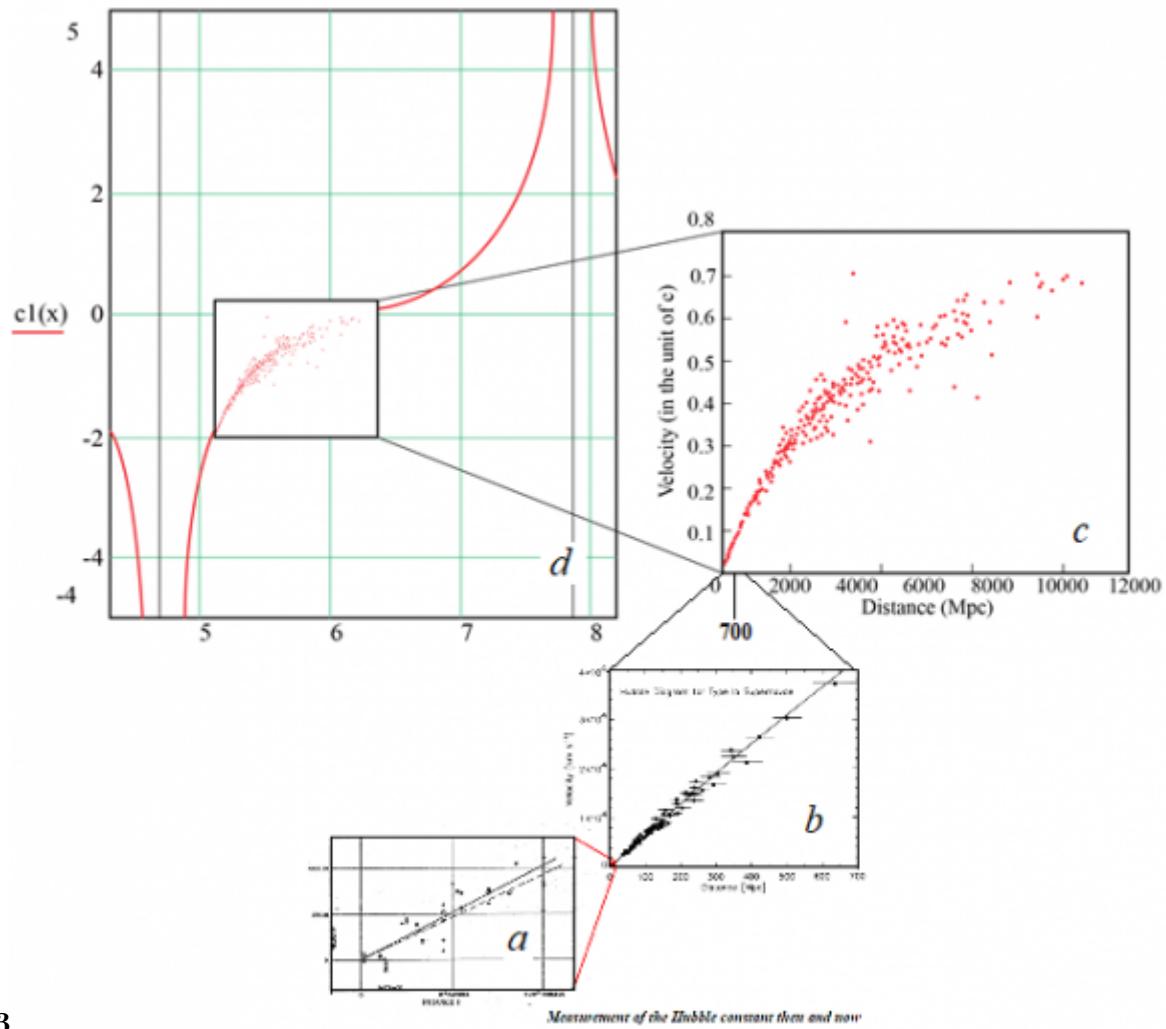
Figure 3:



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*Measurement of the Hubble constant then and now*

Figure 4: Figure 2 :



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Figure 5: Figure 3 :

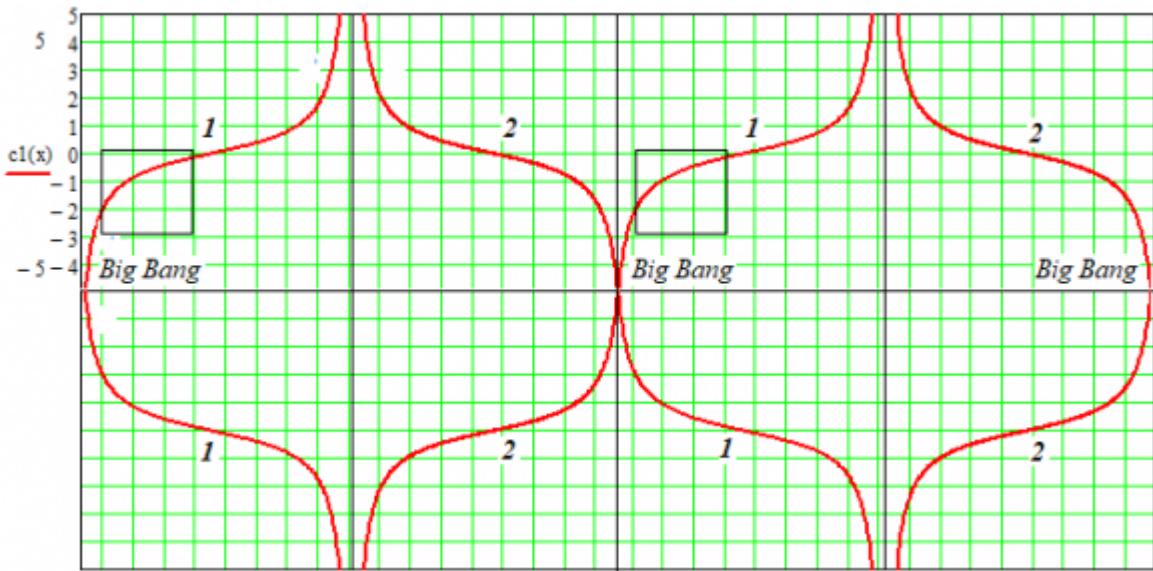


Figure 6: ?

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Figure 7:



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### 7 III. CONCLUSION

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