Observations of *The Hidden Reality*

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The composition of Brian Greene's *The Hidden Reality* is analysed from a personal perspective. The first reference in the index of the book to a subject that draws my attention is found on a page whose page number is an integer power or low-denominational fractional power of π or e, the denominator of the fraction being a power of 2. Subjects of particular interest are found on pages whose page numbers are integer powers of π or e; for subjects of greatest interest the integer is either 3 or 5. Related subjects are found on pages of symmetrically related page number. Again, we see that one's observations create one's reality.

1 Introduction

When I observe a number, *N*, such as the numerical value of some parameter, but actually any number, and then map the number onto another number, *n*, by application of any formula, including an identity function, *n* will lie within any discrete numerical framework of my design [1]. Numbers *n* derived from the parameters of 'interesting' objects, i.e. those objects that draw my attention, often take up prominent locations within the framework. I have now analysed Brian Greene's book *The Hidden Reality* [2], specifically the index, to discover whether I can recognise the attributes of a numerical framework of my design within the pages of what is demonstrably the work of another person. To this end I have made observations of the page numbers of pages on which 'interesting' subjects and persons, and chapters, are introduced; each number has been mapped onto two other numbers by the application of two formulae and I have inserted the new numbers into a two-dimensional framework.

2 The Framework

The page number *N* of the first reference in the index of *The Hidden Reality* to a particular interesting subject or person is mapped onto the numbers n_1 and n_3 by application of the formulae $n_1 = ln(N)/ln(\pi)$ and $n_3 = ln(N)$, i.e. $N = \pi^{n_1}$ and $N = e^{n_3}$. The numbers n_1 and n_3 are then plotted one against the other. The points (n_1, n_3) lie within sequences comprising 'principal levels' of integer n_1 or n_3 and 'sub-levels' of half-integer, quarter-integer, eighth-integer etc n_1 or n_3. 'Superlevels' are principal levels whose level-numbers are multiples of 3 or 5 [3], which are numbers of personal significance. All points (n_1, n_3) in a graph lie on a straight line as n_1 and n_3 are in constant ratio. This framework has been used many times, e.g. in [4].

Points (n_1, n_3) derived from the numerical values of all sorts of parameters have previously been found to lie on the levels and sub-levels of the two sequences comprising the framework. Points derived from the parameters of particularly conspicuous or interesting objects often lie on principal levels in one or the other sequence. Points derived from the most conspicuous or interesting objects often lie on superlevels. Points derived from the parameters of objects that are closely related *in the* *mind of the observe*r often lie in symmetrical arrangement about sub-levels, principal levels or superlevels.

3 Results

The points (n_1, n_3) corresponding to the page numbers of the first references in the index of *The Hidden Reality* to sets of 'interesting' subjects and persons are shown within the framework described above in Figures 1-14. Notes are made of the salient features of each graph.

Different formulae from those described in Section 2 have been used to produce the results shown in Figures 15 and 16.

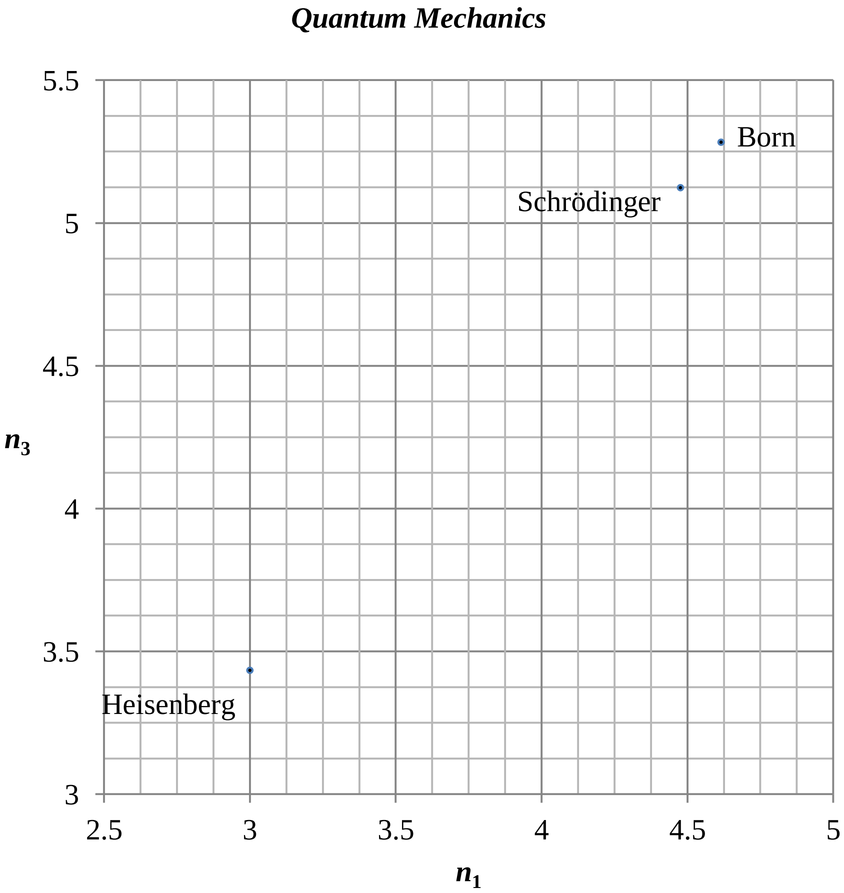

Figure 1: Page numbers of the first references in the index of *The Hidden Reality* to three creators of quantum mechanics. Shown as powers n_1 and n_3 of π and e, respectively.

Werner Heisenberg	p. 31
Erwin Schrödinger	p. 168
Max Born	p. 197

Note: 'Heisenberg' occupies a superlevel in Sequence 1.

'Copenhagen' and 'Many Worlds'

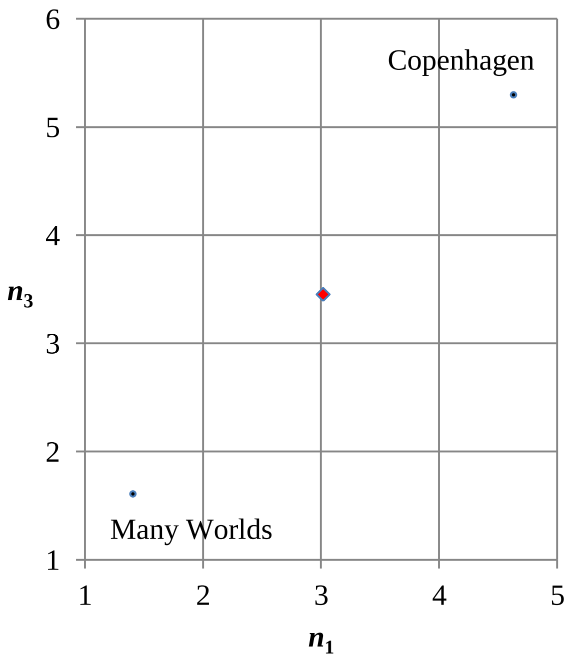

Figure 2: Page numbers of the first references to the 'Copenhagen interpretation' of quantum mechanics and the 'Many Worlds approach' to quantum mechanics in the index of *The Hidden Reality*. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3.

Copenhagen	p. 200
Many Worlds	p. 5

Note: 'Copenhagen' and 'Many Worlds' are arranged symmetrically about a superlevel in Sequence 1.

Parallel universes

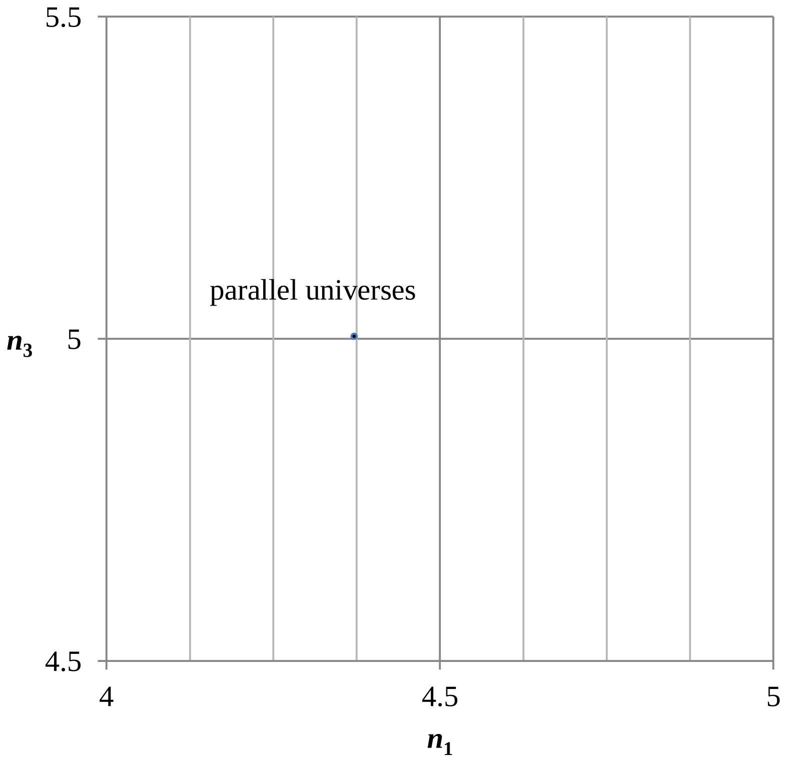

Figure 3: Page number (149) of the first reference to ‘parallel universes’ in the index of *The Hidden Reality*. Shown as powers n_1 and n_3 of π and e, respectively.

Note: ‘Parallel universes’ occupies a superlevel in Sequence 3.

Relativity

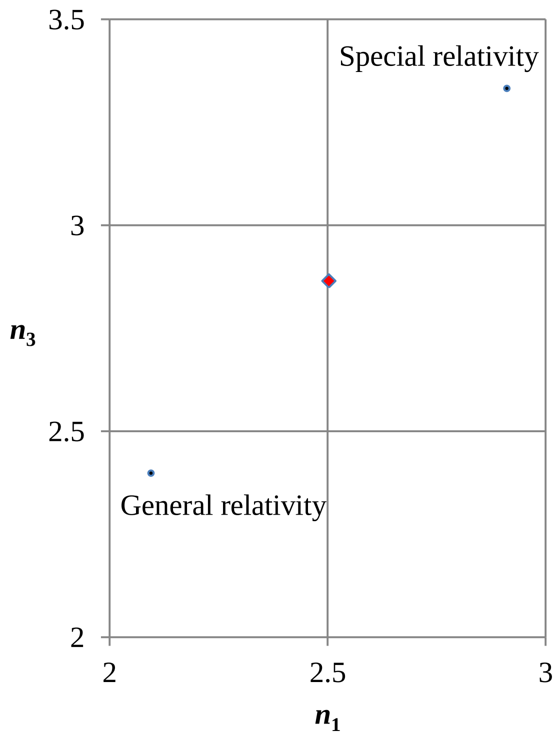

Figure 4: Page numbers of the first references in the index of *The Hidden Reality* to ‘special theory of relativity’ and ‘general theory of relativity’. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3.

Special relativity	p. 28
General relativity	p. 11

Note: ‘Special relativity’ and ‘general relativity’ are arranged symmetrically about a ‘half-level’ in Sequence 1.

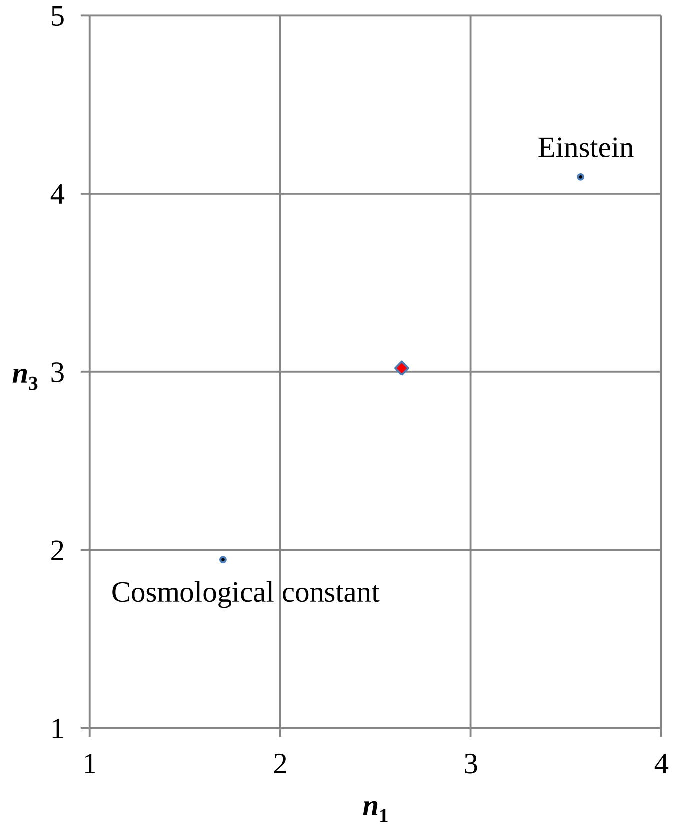

Figure 5: Page numbers of the first references in the index of *The Hidden Reality* to Albert Einstein and 'cosmological constant'. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3.

Einstein	p. 60
Cosmological constant	p. 7

Note: 'Einstein' and 'cosmological constant' are arranged symmetrically about a superlevel in Sequence 3.

$E = mc^2$

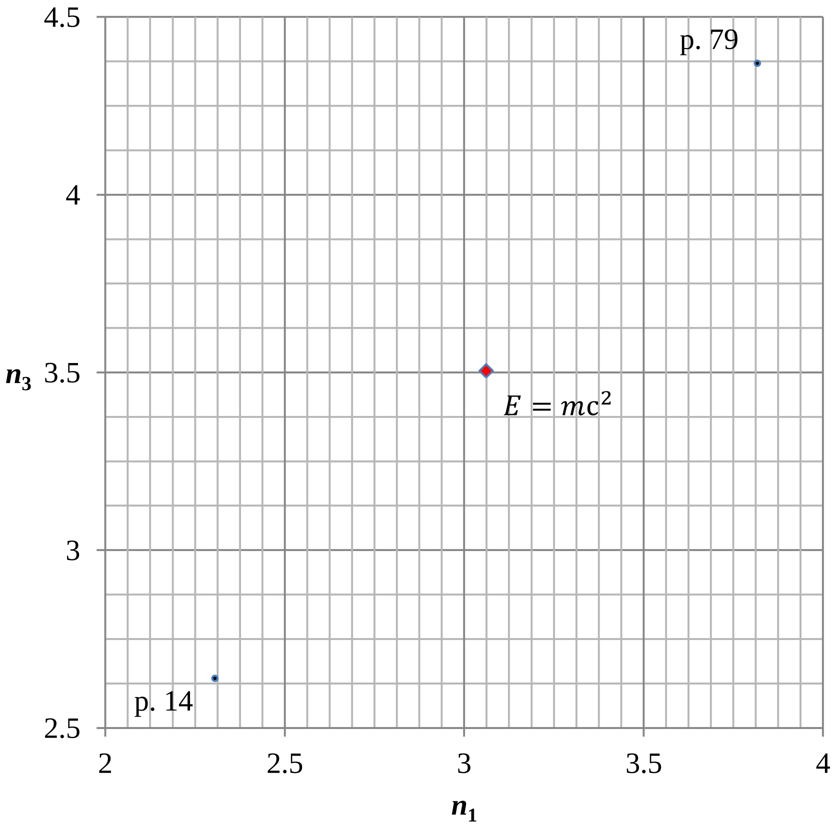

Figure 6: Page numbers (14 and 79) of the two references in the index of *The Hidden Reality* to $E = mc^2$. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3.

Note: The two references to $E = mc^2$ are arranged symmetrically about a half-level in Sequence 3 that is close in value to a superlevel in Sequence 1.

String theory and M-theory

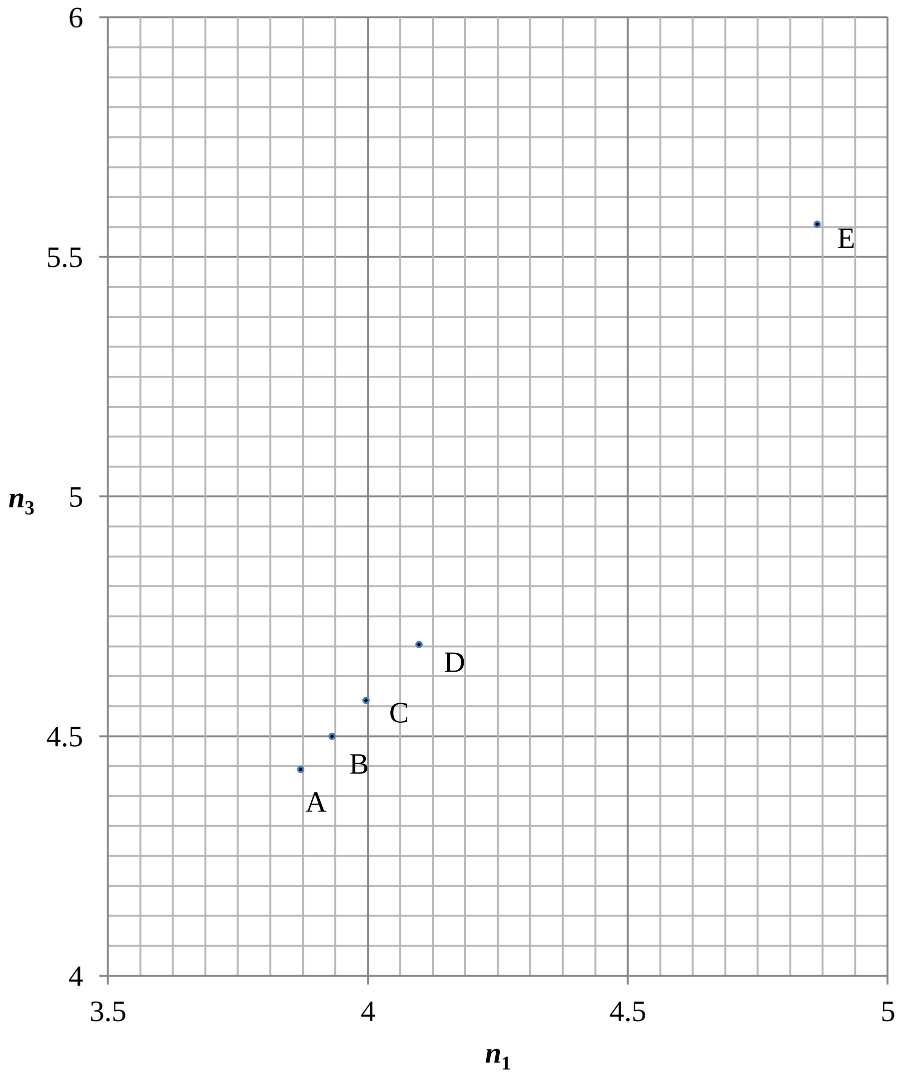

Figure 7: Page numbers of the first references in the index of *The Hidden Reality* to seven mathematicians and physicists whose work has impacted on the development of string theory and M-theory. Shown as powers n_1 and n_3 of π and e, respectively.

A	Theodor Kaluza; Oskar Klein	p. 84
B	Eugenio Calabi; Shing-Tung Yau	p. 90
C	Edward Witten	p. 97
D	Joe Polchinski	p. 109
E	Juan Maldacena	p. 262

Note: ‘Edward Witten’ occupies a principal level in Sequence 1.

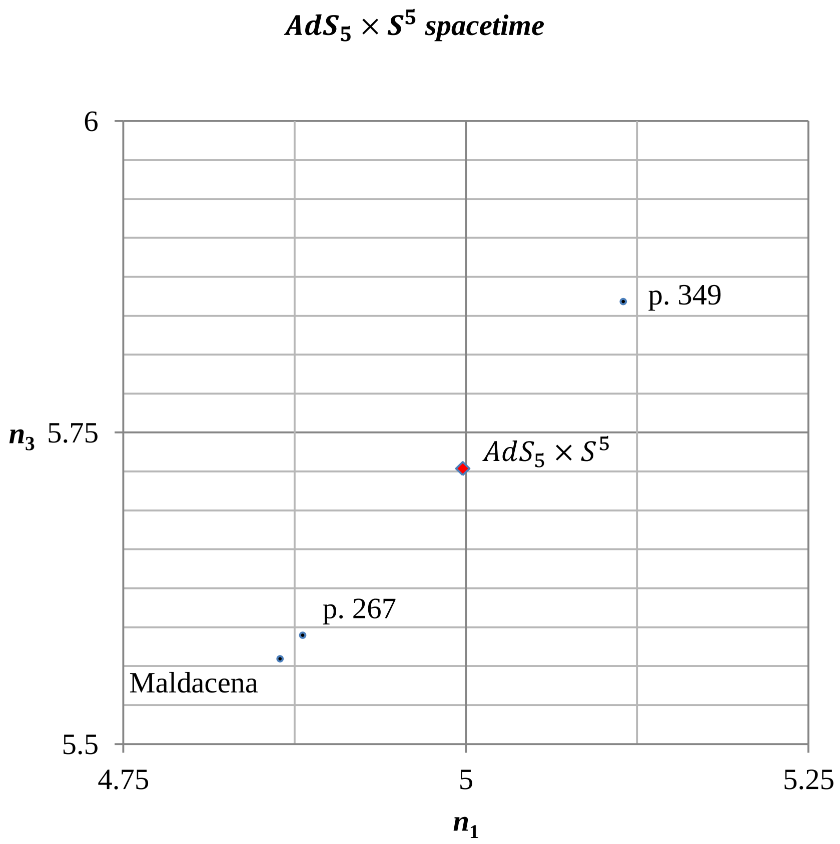

Figure 8: Page numbers of the first reference in the index of *The Hidden Reality* to Juan Maldacena and both references to 'anti-de Sitter five-space times the five sphere'. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3 for the two references to $AdS_5 \times S^5$.

Juan Maldacena	p. 262
$AdS_5 \times S^5$	p. 267
$AdS_5 \times S^5$	p. 349

Note: The first references to 'Maldacena' and $\mathrm{AdS}_5 \times \mathrm{S}^5$ are arranged symmetrically about a sub-level in Sequence 1. The two references to $\mathrm{AdS}_5 \times \mathrm{S}^5$ are arranged symmetrically about a superlevel in Sequence 1.

Universe expansion

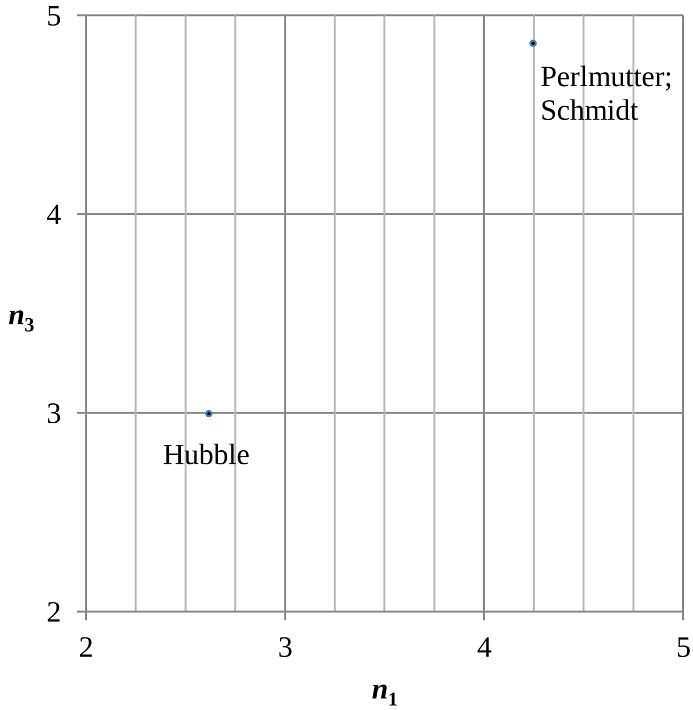

Figure 9: Page numbers of the first references in the index of *The Hidden Reality* to Edwin Hubble, who discovered that the universe is expanding, and Saul Perlmutter and Brian Schmidt, who led the teams[1] that discovered the rate of expansion is accelerating. Shown as powers n_1 and n_3 of π and e, respectively.

Edwin Hubble	p. 20
Saul Perlmutter; Brian Schmidt	p. 129

Note: 'Hubble' occupies a superlevel in Sequence 3.

[1] The Supernova Cosmology Project and the High-Z Supernova Search Team, respectively.

Thermodynamics, entropy and information

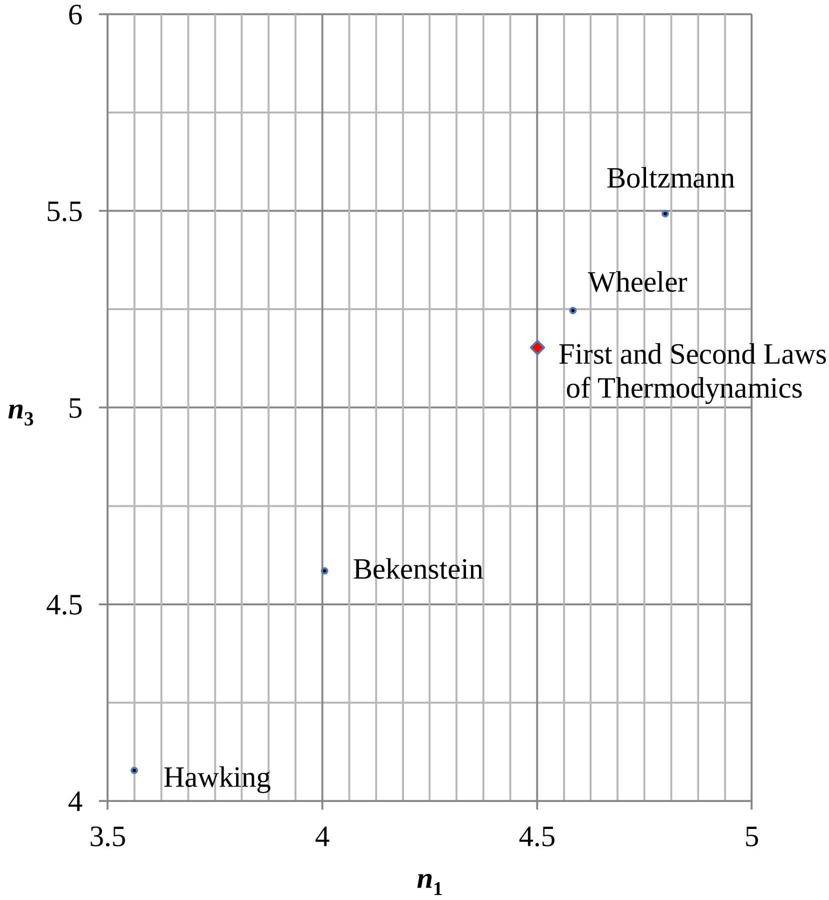

Figure 10: Page numbers of the first references in the index of *The Hidden Reality* to four physicists (Stephen Hawking, Jacob Bekenstein, John Wheeler and Ludwig Boltzmann) who made major contributions to our understanding of thermodynamics, entropy and information theory. The diamond marks the point of mean n_1 and mean n_3 for the first references to 'First Law of Thermodynamics' and 'Second Law of Thermodynamics'. Shown as powers n_1 and n_3 of π and e, respectively.

Hawking	p. 59
Bekenstein	p. 98
First Law	p. 245
Second Law	p. 122
Wheeler	p. 190
Boltzmann	p. 243

Note: 'Bekenstein' occupies a principal level in Sequence 1. The first references to the First and Second Laws of Thermodynamics are arranged symmetrically about a half-level in Sequence 1. 'Boltzmann' occupies a half-level in Sequence 3.

British Scientists I

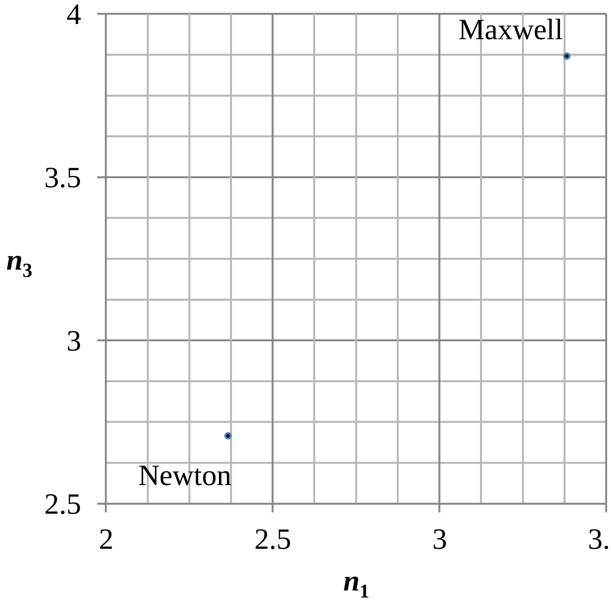

Figure 11: Page numbers of the first references in the index of *The Hidden Reality* to the British scientists Isaac Newton and James Clerk Maxwell. Shown as powers n_1 and n_3 of π and e, respectively.

Newton	p. 15
Maxwell	p. 48

British Scientists II

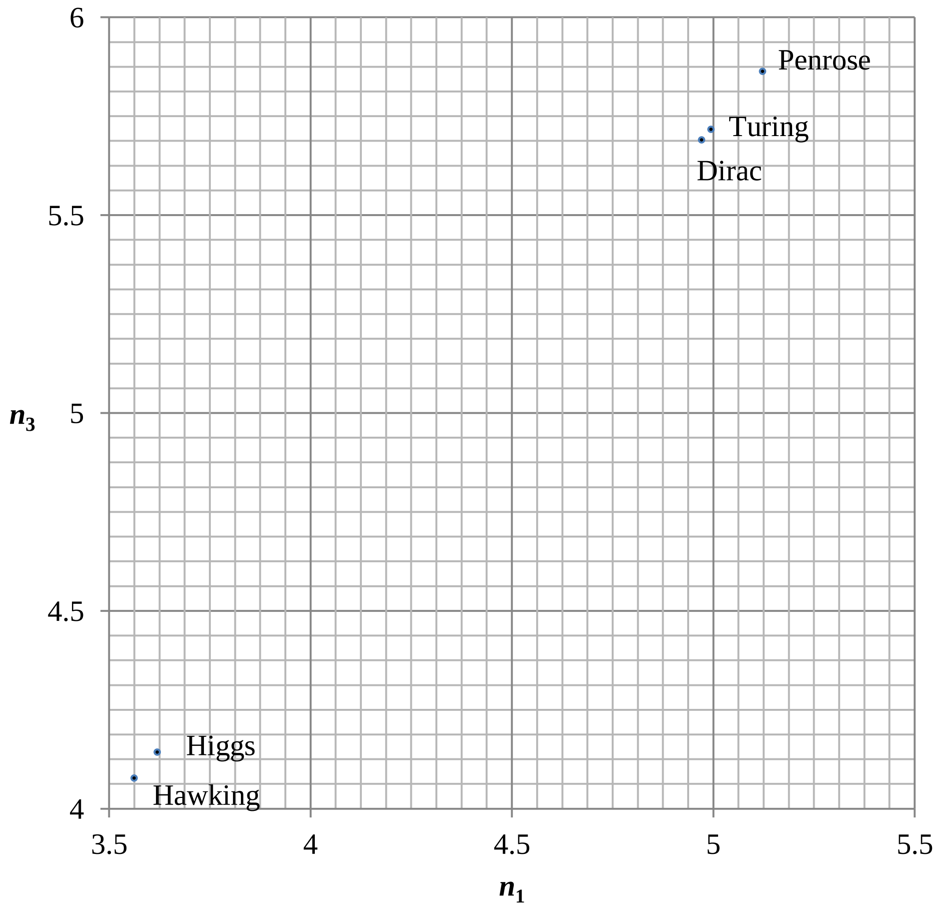

Figure 12: Page numbers of the first references in the index of *The Hidden Reality* to the British scientists Stephen Hawking, Peter Higgs, Paul Dirac, Alan Turing and Roger Penrose. Shown as powers n_1 and n_3 of π and e, respectively.

Hawking	p. 59
Higgs	p. 63
Dirac	p. 296
Turing	p. 304
Penrose	p. 352

Note: 'Turing' occupies a superlevel in Sequence 1.

Sun and Earth

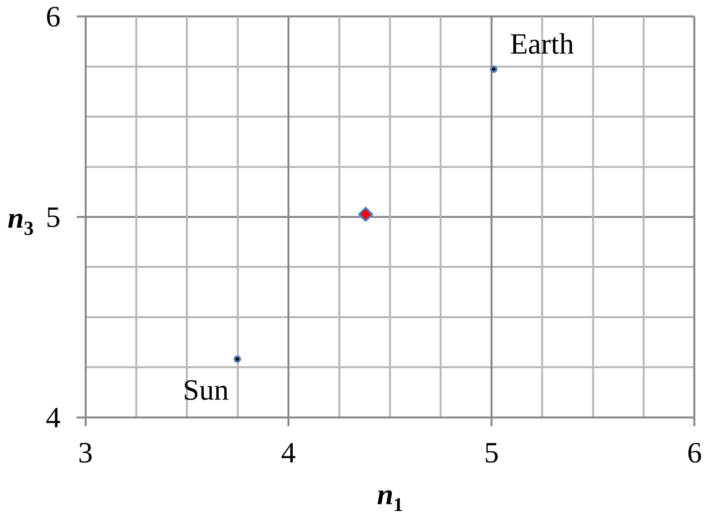

Figure 13: Page numbers of the first references to ‘sun’ and ‘earth’ in the index of *The Hidden Reality*. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3.

Sun	p. 73
Earth	p. 310

Note: ‘Earth’ lies on a superlevel in Sequence 1. The first references to ‘sun’ and ‘earth’ are arranged symmetrically about a superlevel in Sequence 3.

The points (n_1, n_3) corresponding to the page numbers of the pages on which the eleven chapters of *The Hidden Reality* commence are shown in Figure 14 within the framework used up to this point.

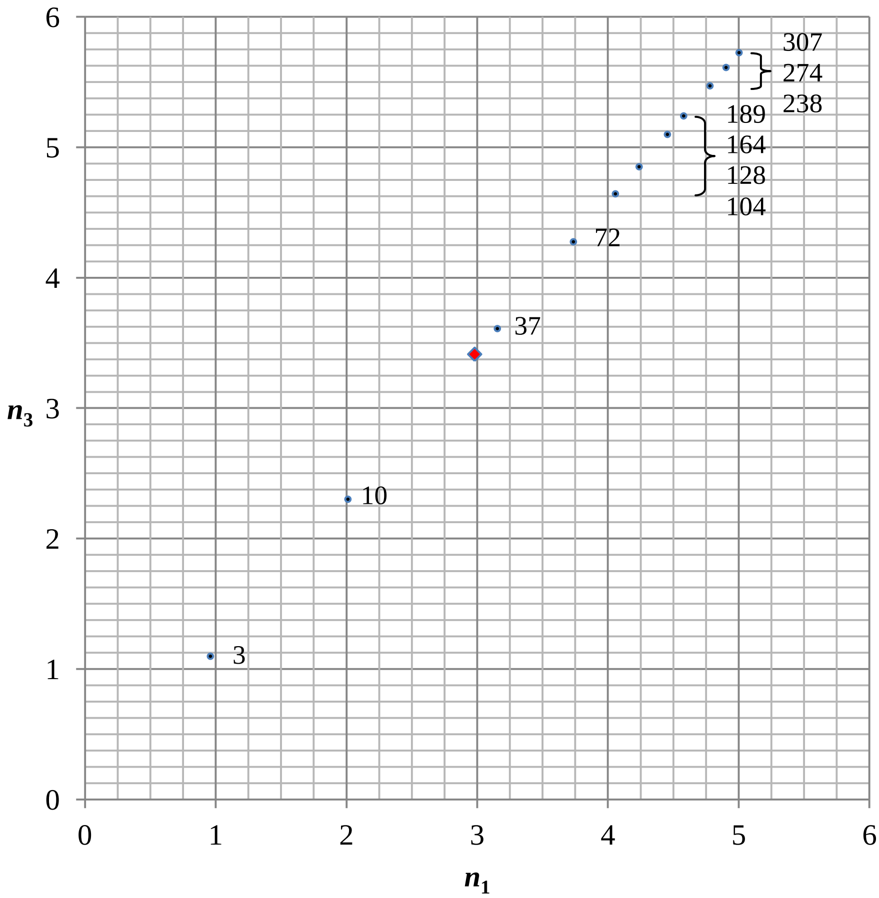

Figure 14: Page numbers of the pages on which the eleven chapters of *The Hidden Reality* commence. Shown as powers n_1 and n_3 of π and e, respectively. The diamond marks the point of mean n_1 and mean n_3 for the first and last chapters.

Note: The range of values of n_1 extends from a principal level to a superlevel and is centred on a superlevel.

Capriciously, after producing the above graphs, the page numbers N of the pages on which the eleven chapters of *The Hidden Reality* commence were mapped onto the numbers n_a and n_b by application of the formulae $n_a = ln(N)/ln(2\pi)$ and $n_b = ln(N/3)$, i.e. $N = (2\pi)^{n_a}$ and $N = 3e^{n_b}$. The two numbers n_a and n_b have been plotted one against the other in Figure 15, where on the whole the points (n_a, n_b) align with the sub-levels shown.

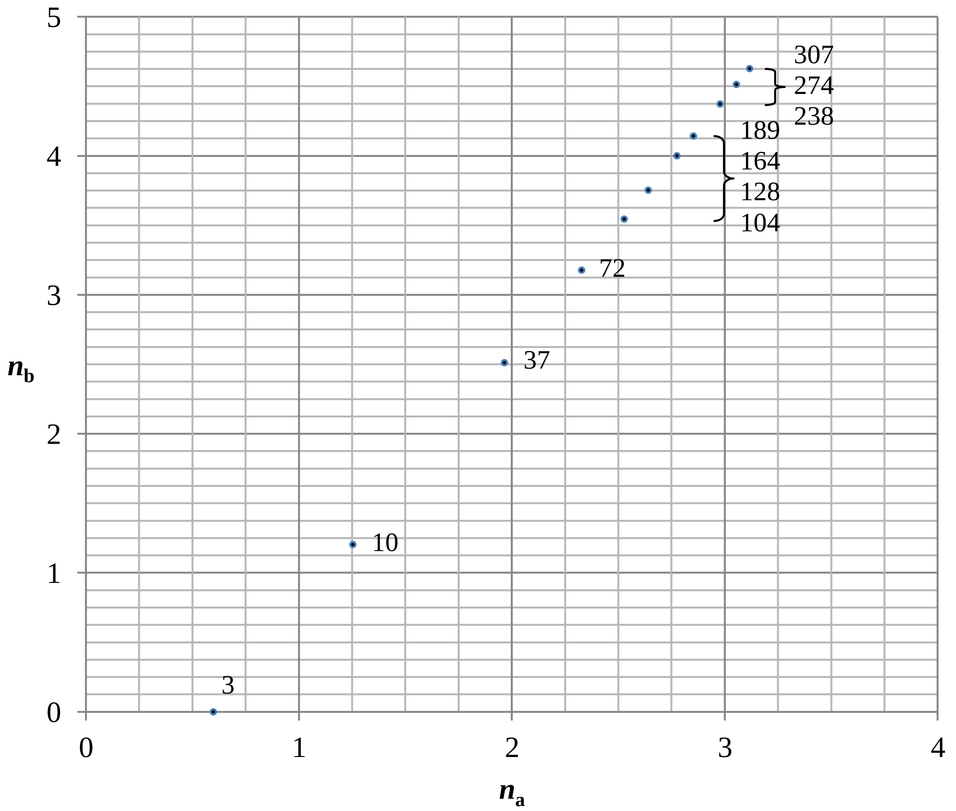

Figure 15: Points (n_a, n_b), where $n_a = ln(N)/ln(2\pi)$ and $n_b = ln(N/3)$, corresponding to the page numbers N of the pages on which the eleven chapters of *The Hidden Reality* commence.

Next, n_a and n_b were calculated from the page numbers of the first references in the index of *The Hidden Reality* to Albert Einstein and Richard Feynman, whose names had drawn my attention but had not featured prominently in their own right in the results of the first analysis; the numbers n_a and n_b were then plotted one against the other. Subsequently, points (n_a, n_b) were added to the graph for all five scientists (Hubble, Heisenberg, Witten, Bekenstein and Turing) who occupied principal levels or superlevels in the first analysis. The result of this procedure is shown in Figure 16.

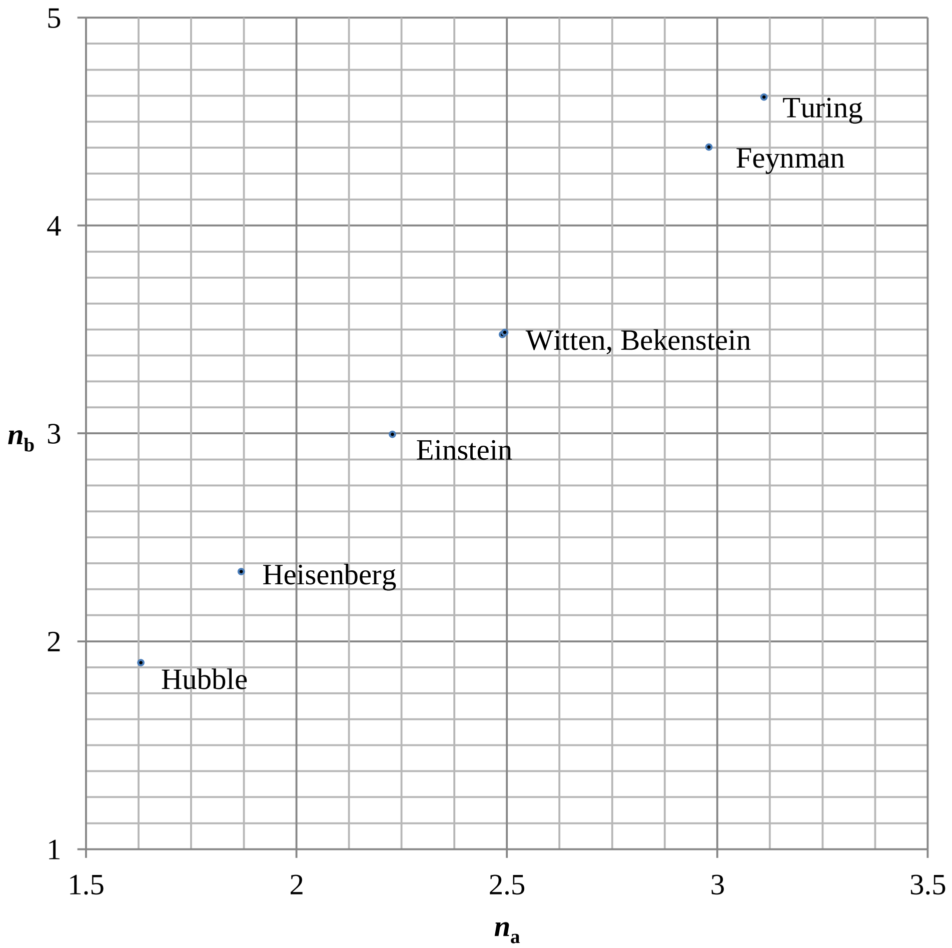

Figure 16: Points (n_a, n_b), where $n_a = ln(N)/ln(2\pi)$ and $n_b = ln(N/3)$, corresponding to the page numbers N of the first references to Edwin Hubble, Werner Heisenberg, Albert Einstein, Edward Witten, Jacob Bekenstein, Richard Feynman and Alan Turing in the index of *The Hidden Reality*.

Hubble	p. 20
Heisenberg	p. 31
Einstein	p. 60
Witten	p. 97
Bekenstein	p. 98
Feynman	p. 239
Turing	p. 304

Note: 'Einstein' occupies a superlevel in Sequence 3. 'Feynman' occupies a sub-level in Sequence 3 that is close in value to a superlevel in Sequence 1.

3 Discussion

Subjects and persons that draw my attention within *The Hidden Reality* are first referred to on pages whose page numbers *N* correspond, after the application of formulae of my choosing, to points (n_1, n_3) or (n_a, n_b) that occupy the levels and sub-levels of a numerical framework of my design. Related interesting subjects and persons correspond to points that typically lie in symmetrical arrangement about levels or sub-levels within the framework. Subjects and persons of special interest are often associated with principal levels and superlevels.

Any number *N* that draws the attention of the observer is mapped by any formula of the observer's choosing onto a number *n* that lies within any discrete framework designed by the observer. The observer's deliberations, conscious or not, sort the values of *n* according to the degree of interest shown by the observer in the thing characterised by *N*, subject to consistency constraints. Pairs of numbers *N* characterising related things may, together, correspond to a number of mean *n*.

A formula that makes sense, intuitively, to the observer and maps numbers *N* that are associated with things of marked interest onto prominent numbers *n* will gain credibility in the mind of the observer. If the numbers *n* also make some sense to the observer, as in [3] where *N* is a particle mass and *n* is thought of as a brane winding number, the formula will gain more credibility.

If a formula makes some sense to the observer in the context of a prevailing framework, as in [5] where the value of the cosmological constant is related to the area of the 5-sphere in $\mathrm{AdS}^5 \times \mathrm{S}^5$ spacetime, then the formula will acquire credibility.

If a formula maps each number *N* of a set of numbers onto prominent numbers *n* and a second formula maps each number *N'* of a different set of numbers onto the same numbers *n* as the first formula, as in [6] where a set of stellar radii are shown to be correlated with the masses of stable atomic nuclei, then a credible relationship will be established between the numbers *N* and the numbers *N'*. If the numbers *N* and the numbers *N'* are the numerical values of parameters then the formula represents a law.

References

1. B. F. Riley, *In the World of the Observer*, viXra:2108.0012
2. Brian Greene, *The Hidden Reality*, Allen Lane 2011
3. B. F. Riley, *The Planck Model*, viXra:1311.0053
4. B. F. Riley, *Our Observations Create Our Reality*, viXra:2012.0047
5. B. F. Riley, *The Cosmological Constant From* $AdS^5 \times S^5$, viXra:1307.0107
6. B. F. Riley, *The Correlation Between Stellar Radii and the Masses of Stable Atomic Nuclei*, viXra:1704.0049