

Modélisation du principe de variété maximale

ANNEXE 1 : Correspondance avec Julain Barbour

De Jean-Nicolas Maisonnier jean.nicolas@maisonnier.com

à Julian Barbour julian@platonica.com

26 janvier 2013 23:30

objet :Maximisation of variety - Wheel mode:

Dear Sir

I recently discover your essay "Bit from it" (congratulations for "it" , and for your Internet Site !)

I'am very interested by the mathematical model you create with Lee Smolin, (a wheel with N slots to be filled with white or black balls in order to maximize variety of neighborhood).

Your results (from N=7 to N=27) show that on the wheel many rows of same color balls contain a number of balls (1, 2,3,7, ..).which is prime

Can we suppose that it will be true for every N ? Prime numbers are'nt good candidates for maximal variety ?

Do you know if somebody after you make calculations for N greater than 27 ?

What kind of algorithm did you use to do it ?

I would like to see if your model has something to do with the structure of genetic code (RNA Codon table)

... but N=64 !

Please excuse my appromative english; I'am french (a retired senior engineer) and I live in St Germain en Laye near Paris.

Sincerely your

... et Bonne année 2013 !

Jean-Nicolas Maisonnier

julian.barbour@physics.ox.ac.uk

To : Jean-Nicolas Maisonnier <jean.nicolas@maisonnier.com> ,

Lee Smolin <lsmolin@perimeterinstitute.ca> ,

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Flavio Mercati <flavio.mercati@gmail.com> ,

Tim Koslowski t.a.koslowski@gmail.com

27 janvier 2013 07:56

Dear Mr Maisonnier,

Thank you for your email. I am copying this answer to Lee and my son Boris, who takes some interest in maximal variety, and also two collaborators.

Your observation about the prime-number sequences is interesting. It had never occurred to me to look for anything like that. It might be chance or related to the low number of slots. A connection to DNA would of course be extremely interesting.

As regards calculations for higher numbers, I am not aware any have been done. Presumably one could get further now, but the exponential increase in the number of options that must be checked out would soon be a problem. I suspect more subtle, non-exhaustive sampling methods might reveal interesting qualitative features.

It is now about 20 years since I did my calculations. My algorithm was pedestrian and involved looking at all odd numbers in binary representation, calculating all the indifferences for each, finding their sum for each and then seeking the minimum among all odd binary numbers of the given number N of

digits. I no longer have the actual algorithm. Even as I type this, my conviction grows that there must be smarter ways of getting results of interest.

I think that is all I can say of any significance. The idea of maximal variety remains attractive to me. Recently my two collaborators (Tim and Flavio) and I have identified a different way to characterize variety (or complexity) in gravitational theory and hope to put out a paper in the next month or so. If you are interested, try putting our names into Google Scholar to see if it has appeared.

Best wishes

Tim Koslowski <t.a.koslowski@gmail.com>

To : julian.barbour@physics.ox.ac.uk

Jean-Nicolas Maisonnier <jean.nicolas@maisonnier.com>,

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27 janvier 2013 16:05

Dear Julian and dear Mr. Maisonnier,
thanks for copying me on this.

A long time ago, I was reading the paper "Occam's Razor as a Formal Basis for a Physical Theory" by A. Soklakov. Julian's response reminded me of that paper.

<http://arxiv.org/abs/math-ph/0009007>

The idea in that paper is similar to "maximization of variety": the author considers information needed to describe a trajectory and then proposes that nature extremizes the Kolmogorov complexity of the trajectory as a physical principle. There are many shortcomings of that paper, one of the main ones is that nothing can be derived, i.e. the author determines the form of the complexity functional from symmetries rather than some information theoretic principles.

Best wishes,

Tim

Jean-Nicolas Maisonnier <jean.nicolas@maisonnier.com>

To : Julian Barbour <julian@platonica.com>,

Tim Koslowski <t.a.koslowski@gmail.com>

28 janvier 2013 18:45

Dear Mister Barbour

Thank you for your rapid answer to my questions.

Since many years I worked with Xavier Sallantin who made interesting hypothesis about the evolution of Universe.

One of them is that the background is not a fixed space-time but a "topo-Universe" where nomades have a value equal or greater than h (Planck constant specifying the value of minimal action) but where directions of each element of action (TxFxL) are undetermined : direction of Time, direction of Force and direction of Space are undetermined (symmetrical). Evolution takes place with a first tuning on thermodynamical direction of Time, then a second step (accordance on a rolling direction of Force) makes life possible, and finally the possibility for a brain to navigate from a level of abstraction to an other without ambiguity allows emergence of homo sapiens.

Those three breaks of physical symmetry would occur with three computational rules, progressively controlled by nature, which lead to our homosapiens arithmetic (breaking symmetry 1 - 0, breaking symmetry between reading from Right or from Left, and breaking symmetry between reading a fraction from Down ou Up)

In short our human arithmetic should not be the nucleo-arithmetic or the bio-arithmetic

That why I am interested in your model where the color of balls are indifferent as well as the direction of reading. It More details are on www.béna.com and www.groupebena.org. ... but my purpose is not to disturb you with those very spéculative ideas !

Best wishes

Julian Barbour <BarbourJ@physics.ox.ac.uk

To :Jean-Nicolas Maisonnier <jean.nicolas@maisonnier.com>

29 janvier 2013 15:06

Thank you for the background. Just at the moment, work on Shape Dynamics is going so well I am totally concentrated on that. However, maximal variety ideas are always in the background and there does some to be a connection with your work. I am a slow worker, so fear I may not be able to give it the attention it deserves.

Very best wishes, Julian Barbour.