Title: Data Mists, Blockchain Republics, and the Moon Shot

Date: Mar 26, 2018 09:15 AM

URL: http://pirsa.org/18030097

Abstract: To do things together it is not enough to know. We must know what others know, and know that they know we know it, a phenomenon known as Common Knowledge. From the Royal Society to the Science and Nature super-journals, scientists have found waysâ€”however flawedâ€”to achieve it. Iâ€™ll introduce the concept of the Artifact, an abstraction that captures the essence of these institutions, and that may help us, in the 21st Century, to go beyond them. And Iâ€™ll propose, playfully, a few endeavors that may help us achieve it: Data Mists, Blockchain Republics, and the Moon Shot.

Data Mists, Blockchain Republics and Moon Shots

Simon DeDeo

Perimeter Rethinking Collaboration Workshop

Carnegie Mellon University & the Santa Fe Institute

Basic Principle of Science

"We must hang together or we shall surely hang separately"

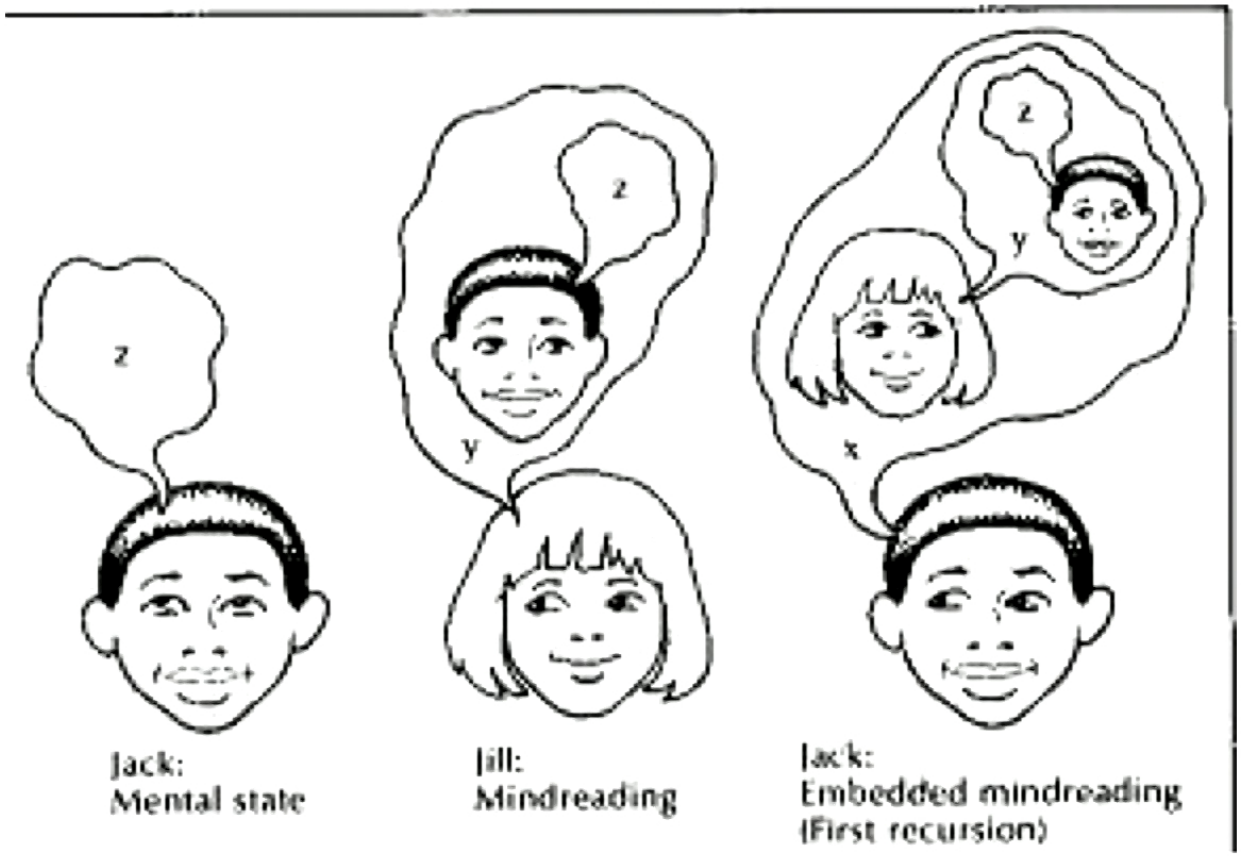
Rousseau's Stag Hunt

Rousseau's Stag Hunt

N-player game

Hunt rabbits separately: small payoff, guaranteed
Hunt stag together: large payoff, but only if *all* go in

Knowledge of Other Minds



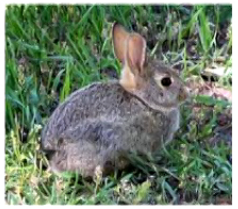
I am willing to hunt stag (but fear that others won't)
level-0

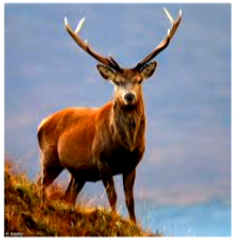
I am willing, and I know you are willing (but do you know I am?)
level-1

I am willing, I know you are willing, I know you know I am willing (but do you know that I know?)
level-2

…

Rabbit equilibrium: level-0





Stag equilibrium: level-infinity

By backwards induction

(If I'm at level N, I think *you* are N-1, which means you think I am N-2, which means you think I think you are N-3…)

How deep do we *actually* go?

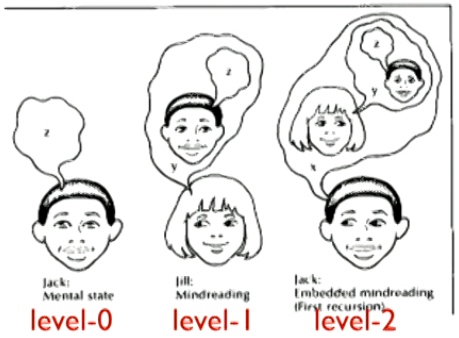
"2/3rds Game": everyone picks a number between 0 and 100

Goal: two-thirds of the average
(i.e., figure out what everyone else is going to think the average is, and go one level deeper)

How deep do we *actually* go?

"2/3rds Game": everyone picks a number between 0 and 100

Goal: two-thirds of the average (i.e., figure out what everyone else is going to think the average is, and go one level deeper)



CMU Undergrads

Actual average: 24.36

Winning guess: 16.23

Random (Level 0): 50

Level 1: 33

Level 2: 22

Level 3: 15

Social Media

Social Media

Justin knows Sora saw it

Sora knows that Justin knows that Sora saw it

Royal Society of London

Origins of the Royal Society

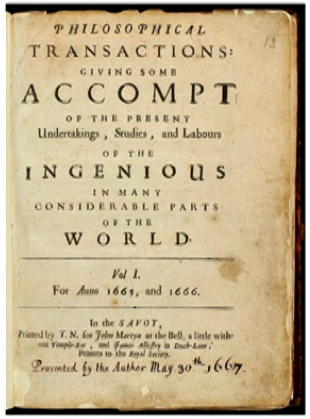
Origins of the Royal Society

Origins of the Royal Society

The Megajournal

Innovations

Royal Society of London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OF THE
WORLD.
Vol. I.
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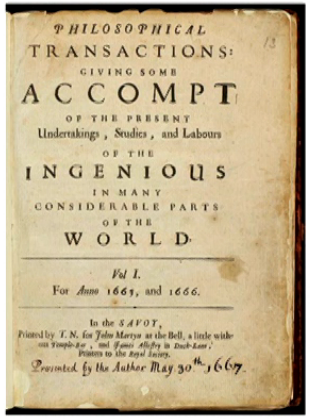
Printed by the Author May 30.th, 1667.

The Megajournal

Innovations

Royal Society of London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Sharing of results

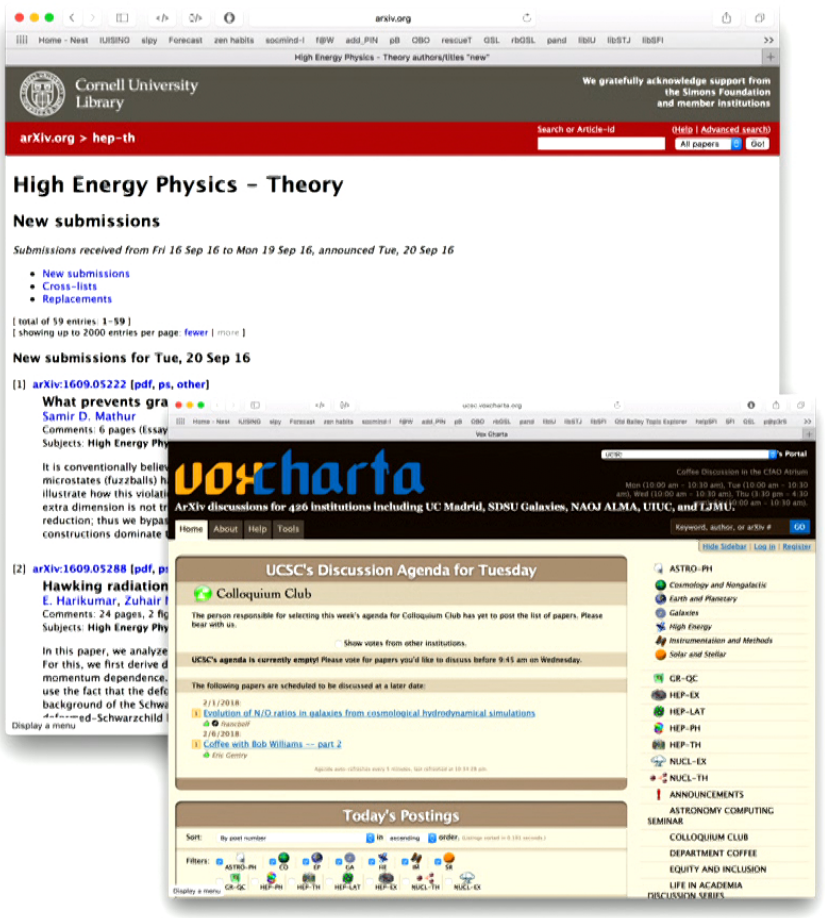
Skepticism (*nullus in verba*)

The Megajournal

Answerable to wider scientific community

Peer review
(?–*Nature* only in 1967)

New Common Knowledge: Preprint Server

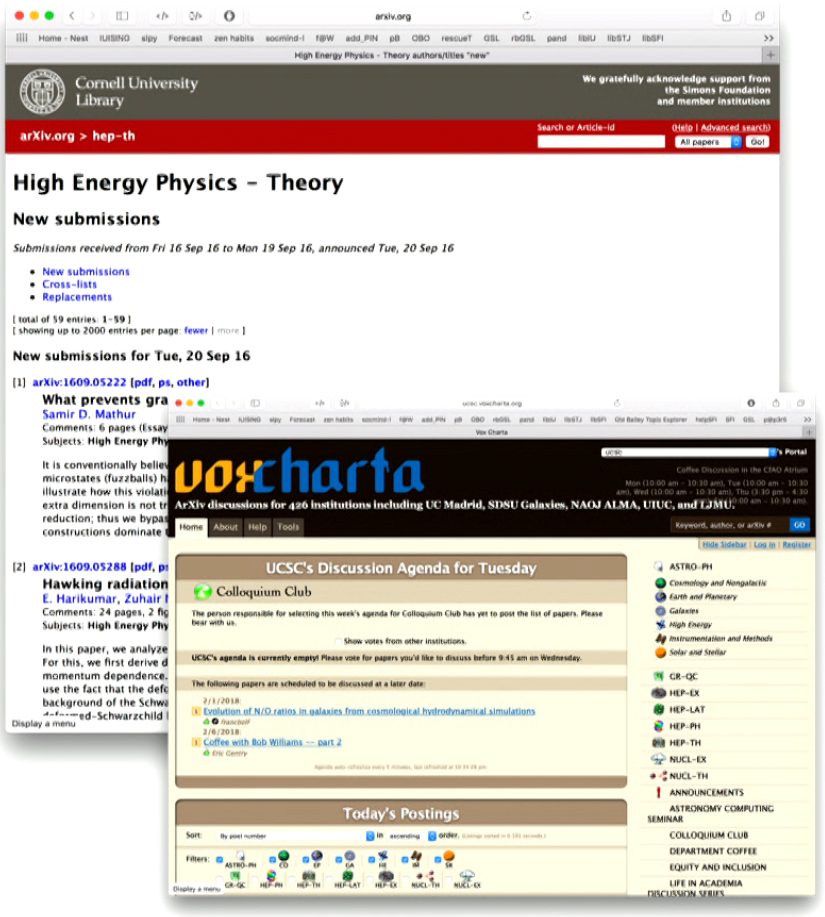


Immediate

Transparent

“Papers in dialogue”

New Common Knowledge: Preprint Server

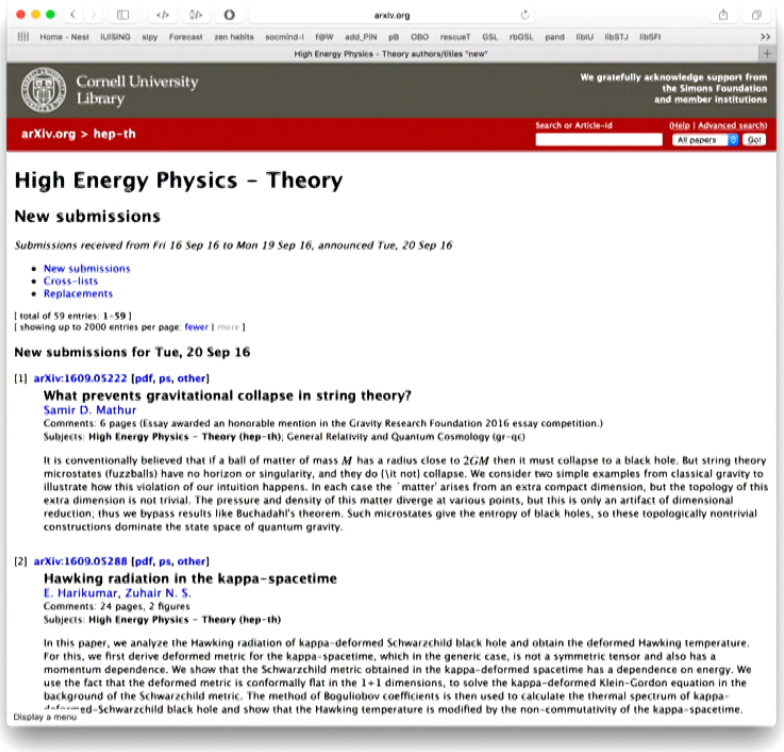


Immediate

Transparent

“Papers in dialogue”

“It works in Practice, not in Theory”



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High Energy Physics - Theory

New submissions

Submissions received from Fri 16 Sep 16 to Mon 19 Sep 16, announced Tue, 20 Sep 16

- New submissions
- Cross-lists
- Replacements

[total of 59 entries: 1-59]
[showing up to 2000 entries per page: fewer | more]

New submissions for Tue, 20 Sep 16

[1] arXiv:1609.05222 [pdf, ps, other]

What prevents gravitational collapse in string theory?

Samir D. Mathur

Comments: 6 pages (Essay awarded an honorable mention in the Gravity Research Foundation 2016 essay competition.)

Subjects: **High Energy Physics - Theory (hep-th)**; General Relativity and Quantum Cosmology (gr-qc)

It is conventionally believed that if a ball of matter of mass M has a radius close to $2GM$ then it must collapse to a black hole. But string theory microstates (fuzzballs) have no horizon or singularity, and they do {\it not} collapse. We consider two simple examples from classical gravity to illustrate how this violation of our intuition happens. In each case the `matter' arises from an extra compact dimension, but the topology of this extra dimension is not trivial. The pressure and density of this matter diverge at various points, but this is only an artifact of dimensional reduction; thus we bypass results like Buchadahl's theorem. Such microstates give the entropy of black holes, so these topologically nontrivial constructions dominate the state space of quantum gravity.

[2] arXiv:1609.05288 [pdf, ps, other]

Hawking radiation in the kappa-spacetime

E. Harikumar, Zuhair N. S.

Comments: 24 pages, 2 figures

Subjects: **High Energy Physics - Theory (hep-th)**

In this paper, we analyze the Hawking radiation of kappa-deformed Schwarzchild black hole and obtain the deformed Hawking temperature. For this, we first derive deformed metric for the kappa-spacetime, which in the generic case, is not a symmetric tensor and also has a momentum dependence. We show that the Schwarzchild metric obtained in the kappa-deformed spacetime has a dependence on energy. We use the fact that the deformed metric is conformally flat in the 1+1 dimensions, to solve the kappa-deformed Klein-Gordon equation in the background of the Schwarzchild metric. The method of Boguliobov coefficients is then used to calculate the thermal spectrum of kappa-deformed-Schwarzchild black hole and show that the Hawking temperature is modified by the non-commutativity of the kappa-spacetime.

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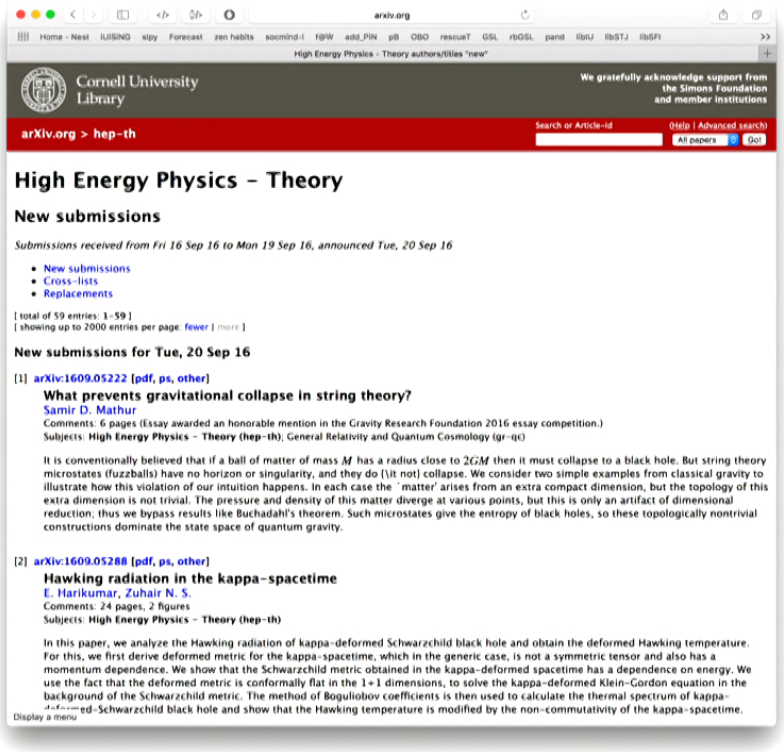

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Priority norms:
early sharing of results,
citations to arXiv papers
“followed through”

Crank-free
(.edu registration and
light behind-the-scenes touches)

arXiv norms in practice

The BICEP2 instrument (foreground) at the South Pole has detected signs of ripples from the Universe's first moments.

COSMOLOGY

Telescope captures view of gravitational waves

Images of the infant Universe reveal evidence for rapid inflation after the Big Bang.

BY RON COWEN IN CAMBRIDGE, MASSACHUSETTS

Astronomers have peered back to nearly the dawn of time and found what seems to be the long-sought 'smoking gun' for the theory that the Universe underwent a spurt of wrenching, exponential growth called inflation during the first tiny fraction of a second of its existence.

Using a radio telescope at the South Pole, the US-led team has detected the first evidence of primordial gravitational waves, ripples in space that inflation generated 13.8 billion years ago when the Universe first started to expand.

The telescope captured a snapshot of the waves as they continued to ripple through the Universe some 380,000 years later, when stars had not yet formed and matter was still scattered across space as a broth of plasma. The image was seen in the cosmic microwave background (CMB), the glow that radiated from that white-hot plasma and that over billions of years of cosmic expansion has cooled to microwave energies.

NATURE.COM
For more on cosmic ripples from the Big Bang:
go.nature.com/ijjbly

The fact that inflation, a quantum ▶

BICEP2 I: Detection Of B-mode Polarization at Degree Angular Scales

P. A. R Ade (1), R. W. Aikin (2), D. Barkats (3), S. J. Benton (4), C. A. Bischoff (5), J. J. Bock (2,6), J. A. Brevik (2), I. Buder (5), E. Bullock (7), C. D. Dowell (6), L. Duband (8), J. P. Filippini (2), S. Fliescher (9), S. R. Golwala (2), M. Halpern (10), M. Hasselfield (10), S. R. Hildebrandt (2,6), G. C. Hilton (11), V. V. Hristov (2), K. D. Irwin (12,13,11), K. S. Karkare (5), J. P. Kaufman (14), B. G. Keating (14), S. A. Kernasovskiy (12), J. M. Kovac (5), C. L. Kuo (12,13), E. M. Leitch (15), M. Lueker (2), P. Mason (2), C. B. Netterfield (4,16), H. T. Nguyen (6), R. O'Brient (6), R. W. Ogburn IV (12,13), A. Orlando (14), C. Pryke (9,7), C. D. Reintsema (11), S. Richter (5), R. Schwarz (9), C. D. Sheehy (9,15), Z. K. Staniszewski (2,6), R. V. Sudiwala (1), G. P. Teply (2), et al. (5 additional authors not shown)

(Submitted on 17 Mar 2014 (v1), last revised 23 Jun 2014 (this version, v3))

(abridged for arXiv) We report results from the BICEP2 experiment, a cosmic microwave background (CMB) polarimeter specifically designed to search for the signal of inflationary gravitational waves in the B-mode power spectrum around $\ell \sim 80$. The telescope comprised a 26 cm aperture all-cold refracting optical system equipped with a focal plane of 512 antenna coupled transition edge sensor 150 GHz bolometers each with temperature sensitivity of $\approx 300 \mu K_{CMB} \sqrt{s}$. BICEP2 observed from the South Pole for three seasons from 2010 to 2012. A low-foreground region of sky with an effective area of 380 square deg was observed to a depth of 87 nK deg in Stokes Q and U. We find an excess of B-mode power over the base lensed-LCDM expectation in the range $30 < \ell < 150$, inconsistent with the null hypothesis at a significance of $> 5\sigma$. Through jackknife tests and simulations we show that systematic contamination is much smaller than the observed excess. We also examine a number of available models of polarized dust emission and find that at their default parameter values they predict power $\sim (5 - 10)\times$ smaller than the observed excess signal. However, these models are not sufficiently constrained to exclude the possibility of dust emission bright enough to explain the entire excess signal. Cross correlating BICEP2 against 100 GHz maps from the BICEP1 experiment, the excess signal is confirmed and its spectral index is found to be consistent with that of the CMB, disfavoring dust at 1.7σ. The observed B-mode power spectrum is well fit by a lensed-LCDM + tensor theoretical model with tensor-to-scalar ratio $r = 0.20^{+0.07}_{-0.05}$, with $r = 0$ disfavored at 7.0σ. Accounting for the contribution of foreground dust will shift this value downward by an amount which will be better constrained with upcoming data sets.

Comments: 26 pages, 14 figures
Subjects: **Cosmology and Nongalactic Astrophysics (astro-ph.CO)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Phenomenology (hep-ph); High Energy Physics - Theory (hep-th)
Journal reference: Phys. Rev. Lett. 112, 241101 (2014)
DOI: 10.1103/PhysRevLett.112.241101
Cite as: arXiv:1403.3985 [astro-ph.CO]
(or arXiv:1403.3985v3 [astro-ph.CO] for this version)

Submission history

From: Clement Pryke [view email]
[v1] Mon, 17 Mar 2014 02:14:52 GMT (1521kb,D)
[v2] Tue, 18 Mar 2014 17:40:12 GMT (1521kb,D)
[v3] Mon, 23 Jun 2014 17:39:37 GMT (1474kb,D)

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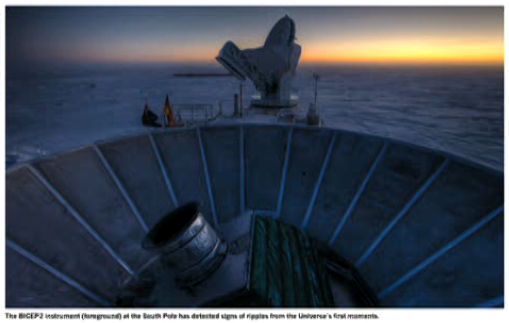

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Telescope captures view of gravitational waves

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(Submitted on 17 Mar 2014 (v1), last revised 23 Ju

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Comments: 26 pages, 14 figures
Subjects: **Cosmology and Nongalactic A** Phenomenology (hep-ph); High
Journal reference: Phys. Rev. Lett. 112, 241101 (2

Toward an Understanding of Foreground Emission in the BICEP2 Region

Raphael Flauger, J. Colin Hill, David N. Spergel

(Submitted on 28 May 2014 (v1), last revised 20 Jun 2014 (this version, v2))

BICEP2 has reported the detection of a degree-scale B-mode polarization pattern in the Cosmic Microwave Background (CMB) and has interpreted the measurement as evidence for primordial gravitational waves. Motivated by the profound importance of the discovery of gravitational waves from the early Universe, we examine to what extent a combination of Galactic foregrounds and lensed E-modes could be responsible for the signal. We reanalyze the BICEP2 results and show that the 100x150 GHz and 150x150 GHz data are consistent with a cosmology with r=0.2 and negligible foregrounds, but also with a cosmology with r=0 and a significant dust polarization signal. We give independent estimates of the dust polarization signal in the BICEP2 region using four different approaches. While these approaches are consistent with each other, the expected amplitude of the dust polarization power spectrum remains uncertain by about a factor of three. The lower end of the prediction leaves room for a primordial contribution, but at the higher end the dust in combination with the standard CMB lensing signal could account for the BICEP2 observations, without requiring the existence of primordial gravitational waves. By measuring the cross-correlations between the pre-Planck templates used in the BICEP2 analysis and between different versions of a data-based template, we emphasize that cross-correlations between models are very sensitive to noise in the polarization angles and that measured cross-correlations are likely underestimates of the contribution of foregrounds to the map. These results suggest that BICEP1 and BICEP2 data alone cannot distinguish between foregrounds and a primordial gravitational wave signal, and that future Keck Array observations at 100 GHz and Planck observations at higher frequencies will be crucial to determine whether the signal is of primordial origin. (abridged)

Comments: 11 pages, 5 figures, v2: typographical errors corrected, references added, comments added, submitted for publication in JCAP
Subjects: **Cosmology and Nongalactic Astrophysics (astro-ph.CO)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Phenomenology (hep-ph); High Energy Physics - Theory (hep-th)
DOI: 10.1088/1475-7516/2014/08/039
Cite as: arXiv:1405.7351 [astro-ph.CO]
(or arXiv:1405.7351v2 [astro-ph.CO] for this version)

Reanalysis of the BICEP2, Keck and Planck Data: No Evidence for Grav Radiation

J. Richard Gott III (Princeton University), Wesley N. Colley (University of Alabama in Huntsville)

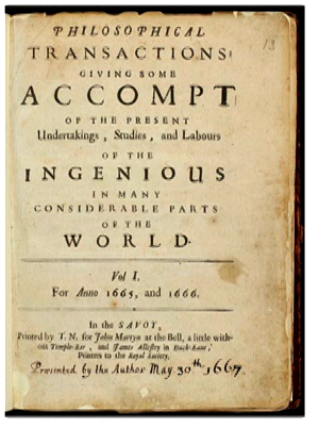
(Submitted on 21 Jul 2017)

A joint analysis of data collected by the Planck and BICEP2+Keck teams has previously given $r = 0.09^{+0.06}_{-0.04}$ for BICEP2 and r Keck. Analyzing BICEP2 using its published noise estimate, we had earlier (Colley & Gott 2015) found $r = 0.09 \pm 0.04$, agre joint results for BICEP2. With the Keck data now available, we have done something the joint analysis did not: a correlation BICEP2 vs. Keck B-mode maps. Knowing the correlation coefficient between the two and their amplitudes allows us to deter each map (which we check using the E-modes). We find the noise power in the BICEP2 map to be twice the original BICEP2 estimate, explaining the anomalously high r value obtained by BICEP2. We now find $r = 0.004 \pm 0.04$ for BICEP2 and $r =$ Keck. Since $r \geq 0$ by definition, this implies a maximum likelihood value of $r = 0$, or no evidence for gravitational waves. Starobinsky Inflation ($r = 0.0036$) is not ruled out, however. Krauss & Wilzcek (2014) have already argued that "measurement of polarization of the CMB due to a long-wavelength stochastic background of gravitational waves from Inflation in the early Universe would firmly establish the quantization of gravity," and, therefore, the existence of gravitons. We argue it would also constitute a detection of gravitational Hawking radiation (explicitly from the causal horizons due to Inflation).

The Fourth Square

	Small	Large
Authoritarian	Classroom	Royal Society, Scientific Journal, arXiv,…
Decentralized	Seminar	arXiv, Republic of Letters, …?

Royal Society of London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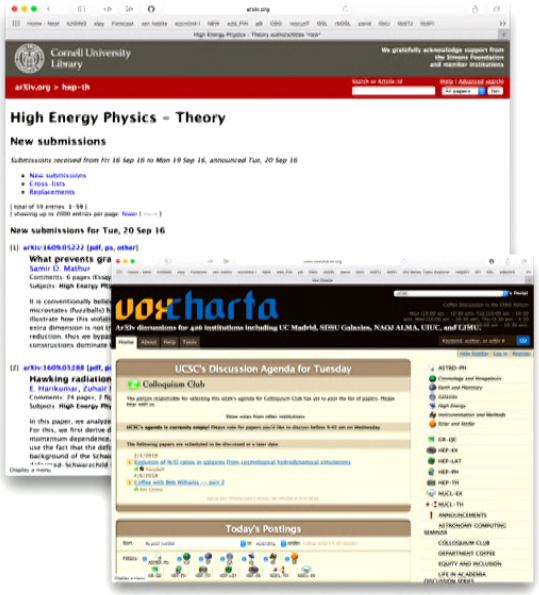

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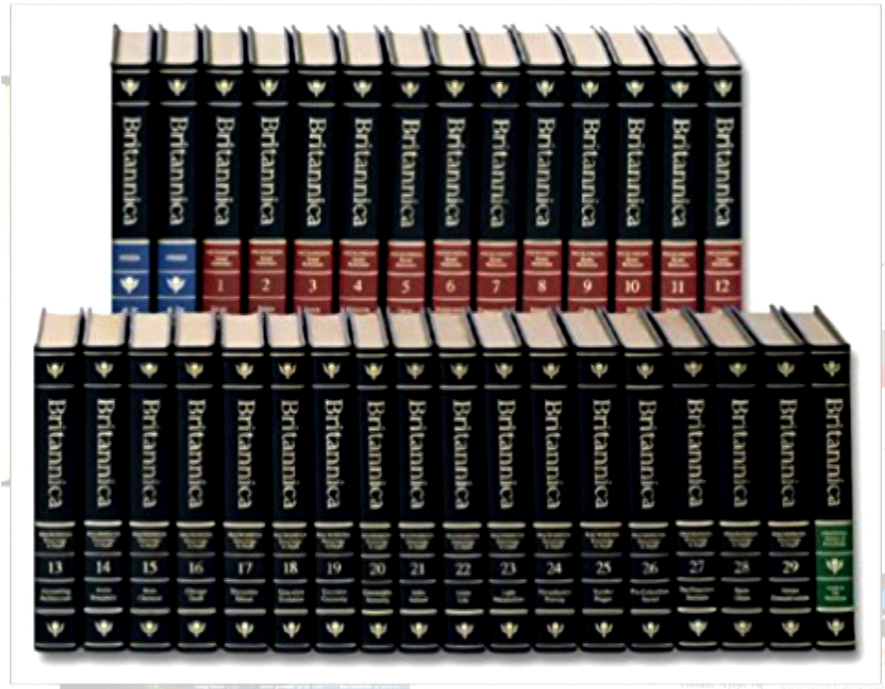
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One Sentence

"the encyclopedia that everyone can edit"

a specific (but generative) fantasy

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Wikipedia:What Wikipedia is not

C H E M

of crabs-eyes, &c. according to the ſubſtances diſſolved. If, inſtead of evaporating the liquor, a fixed alkali be mixed therewith, the abſorbent matter, that was diſſolved by the acid, will precipitate in the form of a white powder, which is called the *magiſtery of coral, of pearls*, &c.

The Acid of Vinegar combined with copper. Verdegris. Cryſtals of Copper. This Combination decompounded. Spirit of Verdegris.

h2g2

From Wikipedia, the free encyclopedia

h2g2 is an initialism for The Hitchhiker's Guide to the Galaxy.

The **h2g2** website is a British-based collaborative online encyclopedia project. It describes itself as "an unconventional guide to life, the universe, and everything", in the spirit of the fictional publication *The Hitchhiker's Guide to the Galaxy* from the science fiction comedy series of the same name by Douglas Adams.[1] It was founded by Adams in 1999 and was run by the BBC between 2001 and 2011.[2][3][4]

The intent is to create an Earth-focused guide that allows members to share information about their geographic area and the local sites, activities and businesses, to help people decide where they want to go and what they may find when they get there. It has grown to contain subjects from restaurants and recipes, to quantum theory and history. Explicit advertising of businesses was forbidden when the site was run by the BBC, but customer reviews were permitted.[5]

One Sentence

"the encyclopedia that everyone can edit"

The without-which-nothing norm

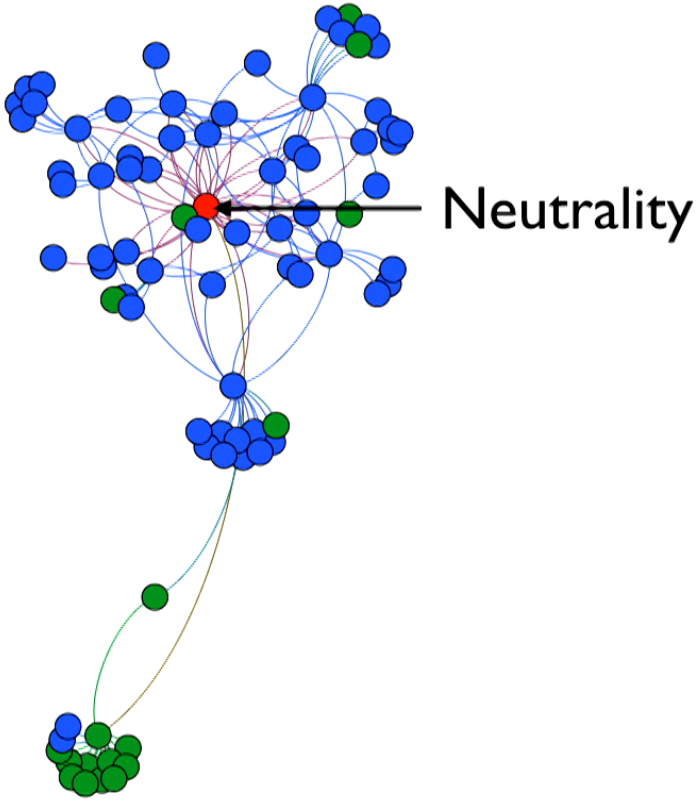
One Sentence

"the encyclopedia that everyone can edit"

The without-which-nothing norm

no top-down solutions allowed
(committees of review, specialist editors,
curators, official content owners, &c.)

Normative Accretion



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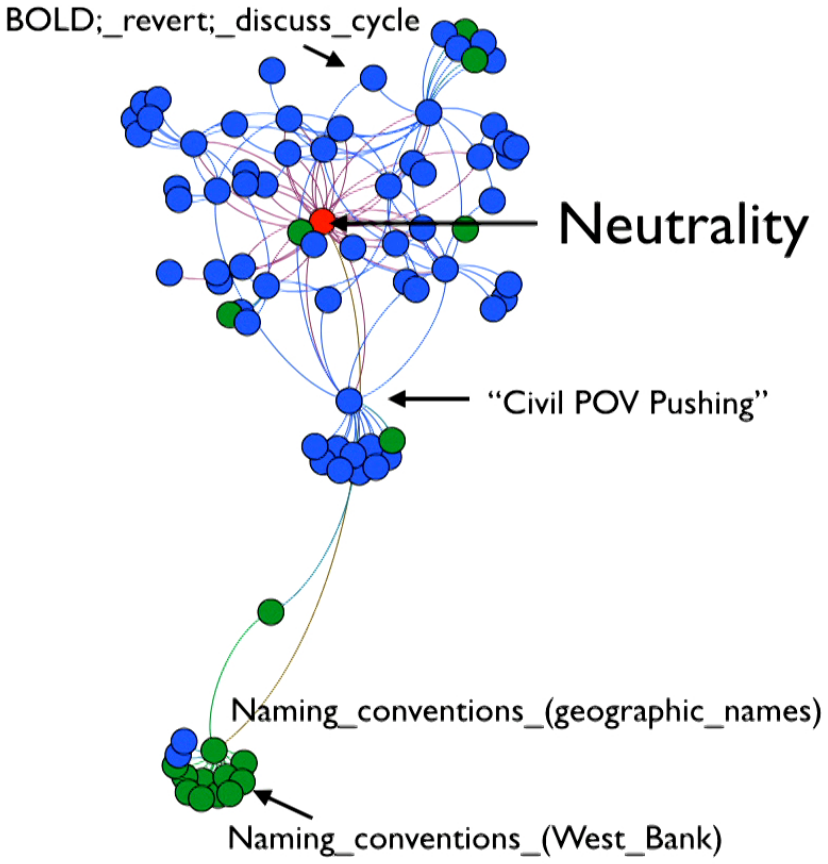

Babylonian Talmud (Vilna Edition)

future internet

MDPI

Article

Conflict and Computation on Wikipedia: A Finite-State Machine Analysis of Editor Interactions

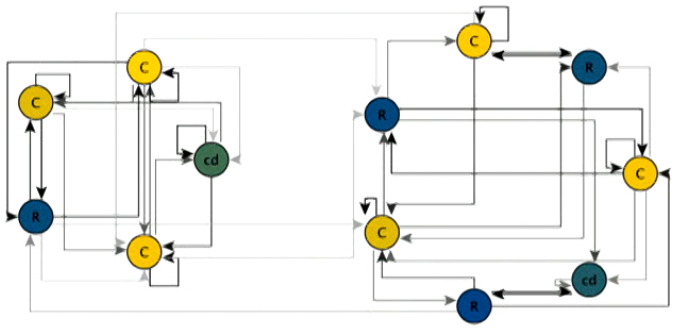

Figure 2: Hidden Markov model for the collective (group-level) cooperation and conflict patterns on the George W. Bush page. States are labeled by the probability of emitting each of the two output symbols; "C" ($P(C) > 0.8$, lighter yellow), "R" ($P(R) > 0.8$, darker blue) or "cr" (otherwise). Edge weights show transition probabilities; the lightest lines, connecting the two subspaces, correspond to probabilities of order 10^{-4}. The system is dominated by a transition logic that, on short timescales, confines the system to one of two separate modules with a high density of internal transitions.

rmatics, Indiana University,
-812-856-2855;

ngton, IN 47406, USA
nue, Bloomington, IN 47408, USA

d a breakdown of relations? a test case, we use a hidden ocial grammar of more than e range of pages, we discover ed, sometimes for months, in s of conflict-tracking "revert" subspace, including tit-for-tat reversion. While a fraction of the transitions between these subspaces are associated with top-down actions taken by administrators, the effects are weak. Surprisingly, we find no statistical signal that transitions are associated with the appearance of particularly anti-social users, and only weak association with significant news events outside the system. These findings are consistent with transitions being driven by decentralized processes with no clear locus of control. Models of belief revision in the presence of a common resource for information-sharing predict the existence of two distinct phases: a disordered high-conflict phase, and a frozen phase with spontaneously-broken symmetry. The bistability we observe empirically may be a consequence of editor turn-over, which drives the system to a critical point between them.

future internet

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Article

Conflict and Computation on Wikipedia: A Finite-State Machine Analysis of Editor Interactions

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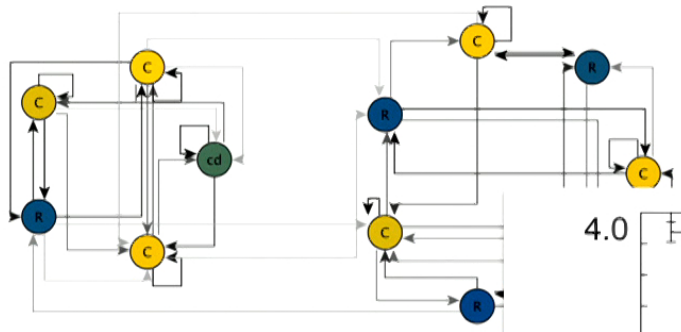

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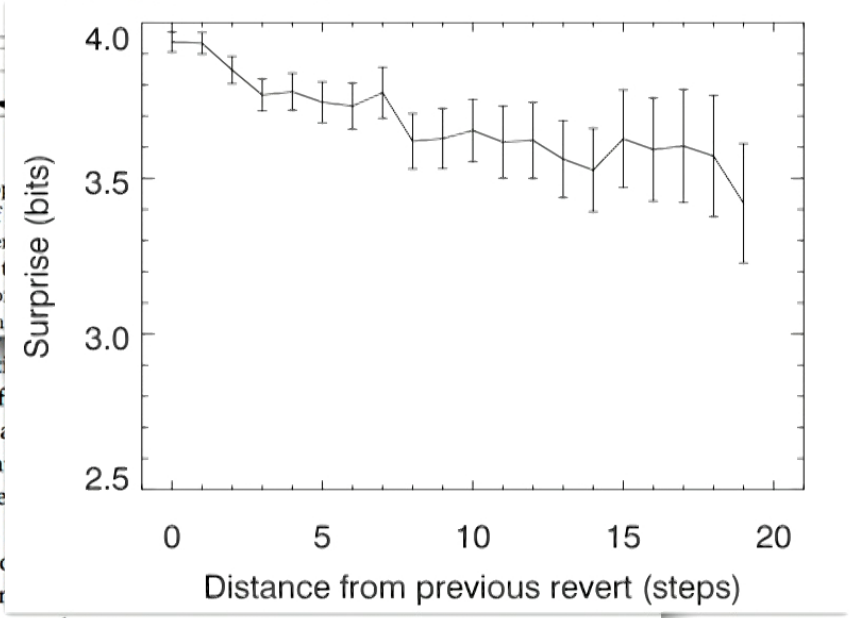
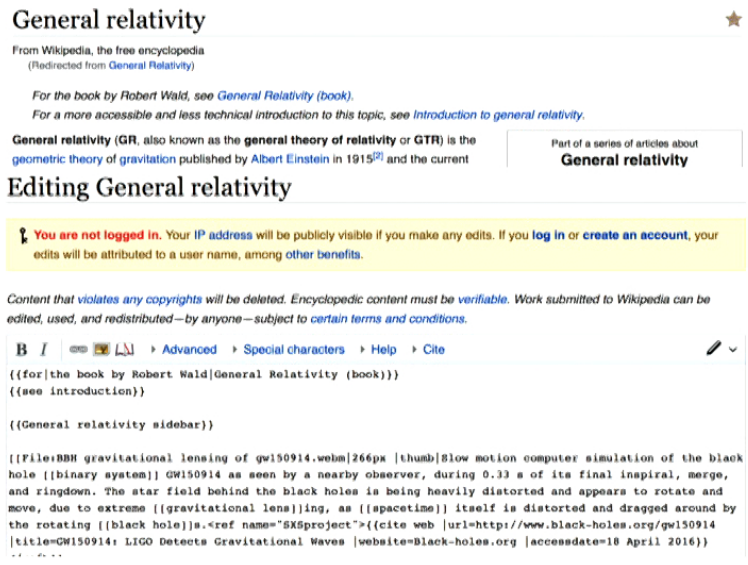
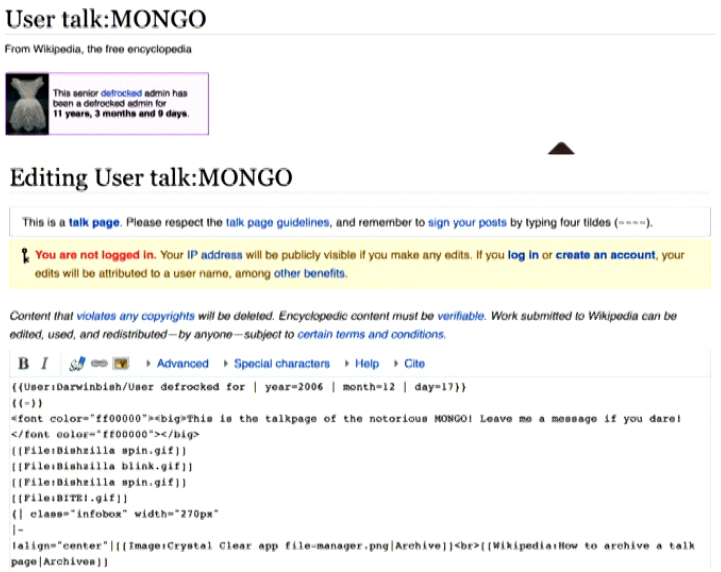


Low "Algorithmic Determinism"

All pages have an identical interface





No threaded discussions, no up/down ratings, no private messaging, no distinctions between "mainspace", "user", "norm",…

Evolvable “Institutions”

[WikiEN-l] Crackpot articles

Jimmy Wales jwales at bomis.com
Sat Jul 12 06:08:32 UTC 2003

- Previous message: [WikiEN-l] Re: Crackpot articles
- Next message: [WikiEN-l] Re: Crackpot articles
- **Messages sorted by:** [date] [thread] [subject] [author]

Chong Yidong wrote:
> *[[Plasma cosmology]]*
> *[[Dynamic theory of gravity]]*
> *[[Rotating magnetic field]]*

I know little enough about physics that I can't say anything
meaningful about these particulars, but I would say

(a) if those are valid concepts about which we need an article, we
should patch these up or rewrite them so they aren't nonsenese

(b) if those are *known* and *popular* crackpot ideas, then we should
have an article about them, identifying them *as* ideas that are completely
rejected by the consensus of leading scientists or NPOV verbiage to that
effect

Evolvable “Institutions”

[WikiEN-l] Crackpot articles

Jimmy Wales jwales at bomis.com
Sat Jul 12 06:08:32 UTC 2003

- Previous message: [WikiEN-l] Re
- Next message: [WikiEN-l] Re: Cr
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effect

[WikiEN-l] NPOV and 'new physics'

Jimmy Wales jwales at joey.bomis.com
Fri Sep 26 13:08:16 UTC 2003

- Previous message: [WikiEN-l] Re: [roy
- Next message: [WikiEN-l] NPOV and '
- **Messages sorted by:** [date] [thread] |

Well, it's against my role as 'the Jim
crackpots, so I'll avoid that word her
mean anyway. ;-)

It has been my long experience, too, t
minds, who are drawn to theorizing abo
physics. Their struggles against the
romantic and lonely; they are voices o
wilderness.

I think this presents challenges for o
special challenges. As with any con
uncontroversial ones, there are mainst
singular views.

[WikiEN-l] Original research

Jimmy (Jimbo) Wales jwales at wikia.com
Fri Dec 3 10:34:03 UTC 2004

- Previous message: [WikiEN-l] Original research
- Next message: [WikiEN-l] Original research
- **Messages sorted by:** [date] [thread] [subject] [author]

The phrase orginated primarily as a practical means to deal with
physics cranks, of which of course there are a number on the web.

The basic concept is as follows: it can be quite difficult for us to
make any valid judgment as to whether a particular thing is _true_ or
not. It isn't appropriate for us to try to determine whether
someone's novel theory of physics is valid, we aren't really equipped
to do that. But what we _can_ do is check whether or not it actually
has been published in reputable journals or by reputable publishers.
So it's quite convenient to avoid judging the credibility of things by
simply sticking to things that have been judged credible by people
much better equipped to decide.

The exact same principle will hold true for history, though I suppose
the application will in some cases be a bit different and more subtle.

Evolvable “Institutions”

[WikiEN-l] Crackpot articles

Jimmy Wales jwales at bomis.com
Sat Jul 12 06:08:32 UTC 2003

- Previous message: [WikiEN-l] Re
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[WikiEN-l] NPOV and 'new physics'

Jimmy Wales jwales at joey.bomis.com
Fri Sep 26 13:08:16 UTC 2003

[WikiEN-l] Original research

Wikipedia:No original research

From Wikipedia, the free encyclopedia
(Redirected from Wikipedia:NOR)

"WP:NOR" redirects here. For the Norway WikiProject, see Wikipedia:WikiProject Norway.
For raising issues with specific articles, see Wikipedia:No original research/Noticeboard.

This page documents an English Wikipedia policy.
It describes a widely accepted standard that all editors should normally follow.
Changes made to it should reflect consensus.

Shortcuts
WP:OR
WP:NOR
WP:ORIGINAL

This page in a nutshell: Wikipedia does not publish original thought: all material in Wikipedia must be attributable to a reliable, published source. Articles may not contain any new analysis or synthesis of published material that serves to reach or imply a conclusion not clearly stated by the sources themselves.

Wikipedia articles must not contain original research. The phrase "original research" (OR) is used on Wikipedia to refer to material—such as facts, allegations, and ideas—for which no reliable, published sources exist.[1] This includes any analysis or synthesis of published material that serves to reach or imply a conclusion not stated by the sources. To demonstrate that you are not adding OR, you must be able to cite reliable, published sources that are *directly related* to the topic of the article, and *directly support* the material being presented. (This policy of no original research does not apply to talk pages and other pages which evaluate article content and sources, such as deletion discussions or policy noticeboards.)

Core content policies
Neutral point of view
No original research
Verifiability

Other content policies
Article titles
Biographies of living persons
Image use policy

al with
the web.

t for us to
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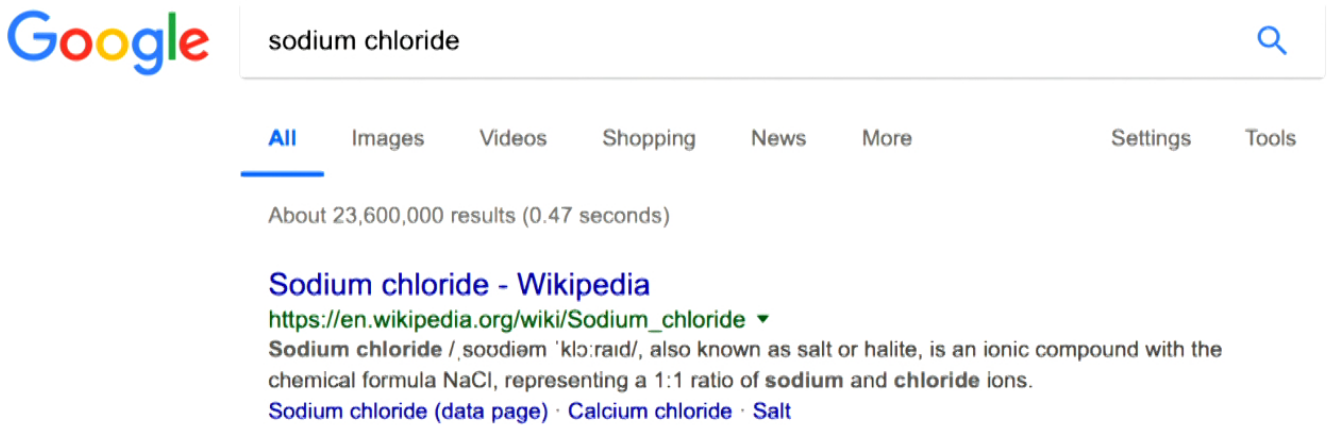
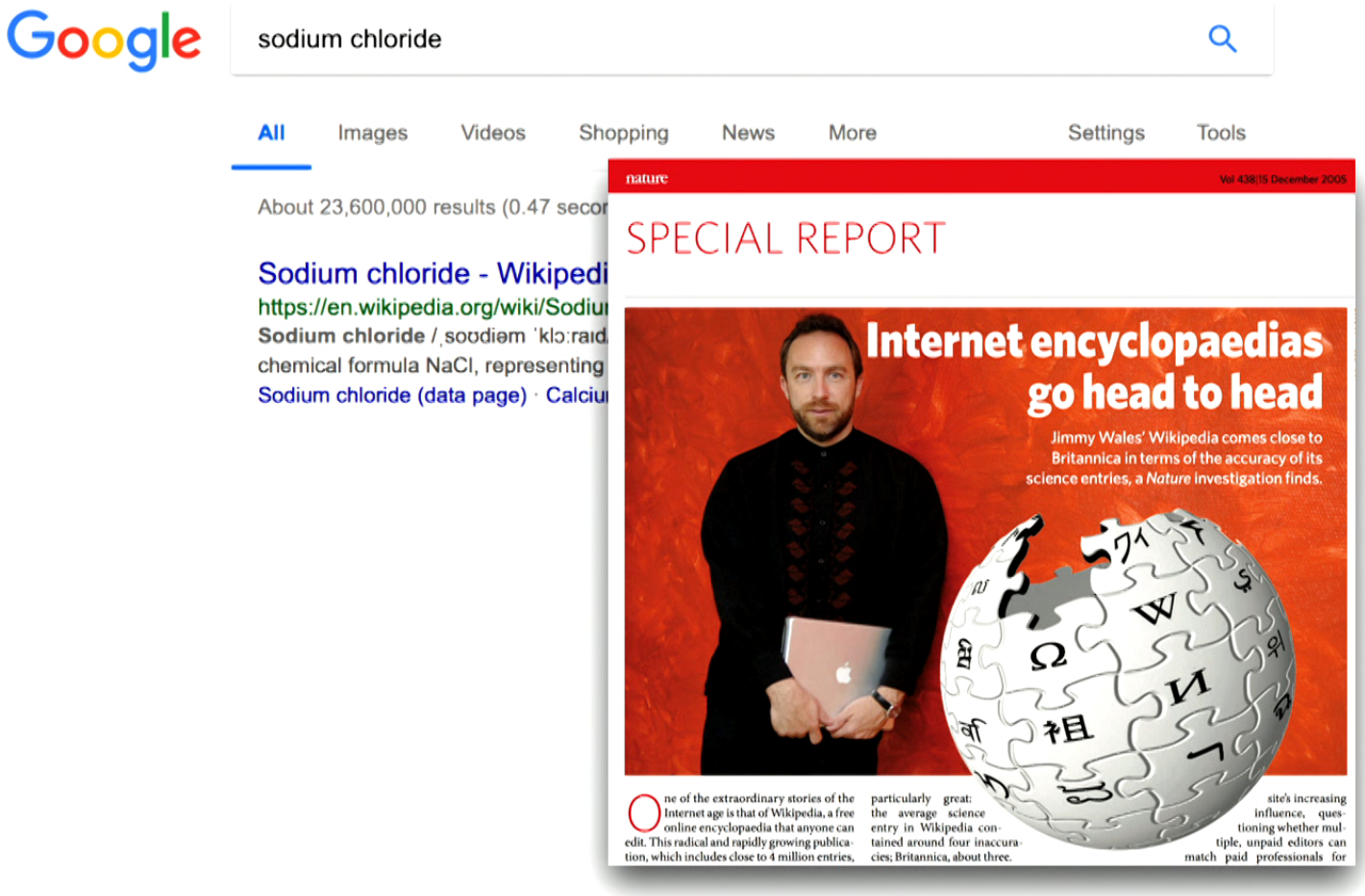
publishers.
of things by
by people

gh I suppose
more subtle.

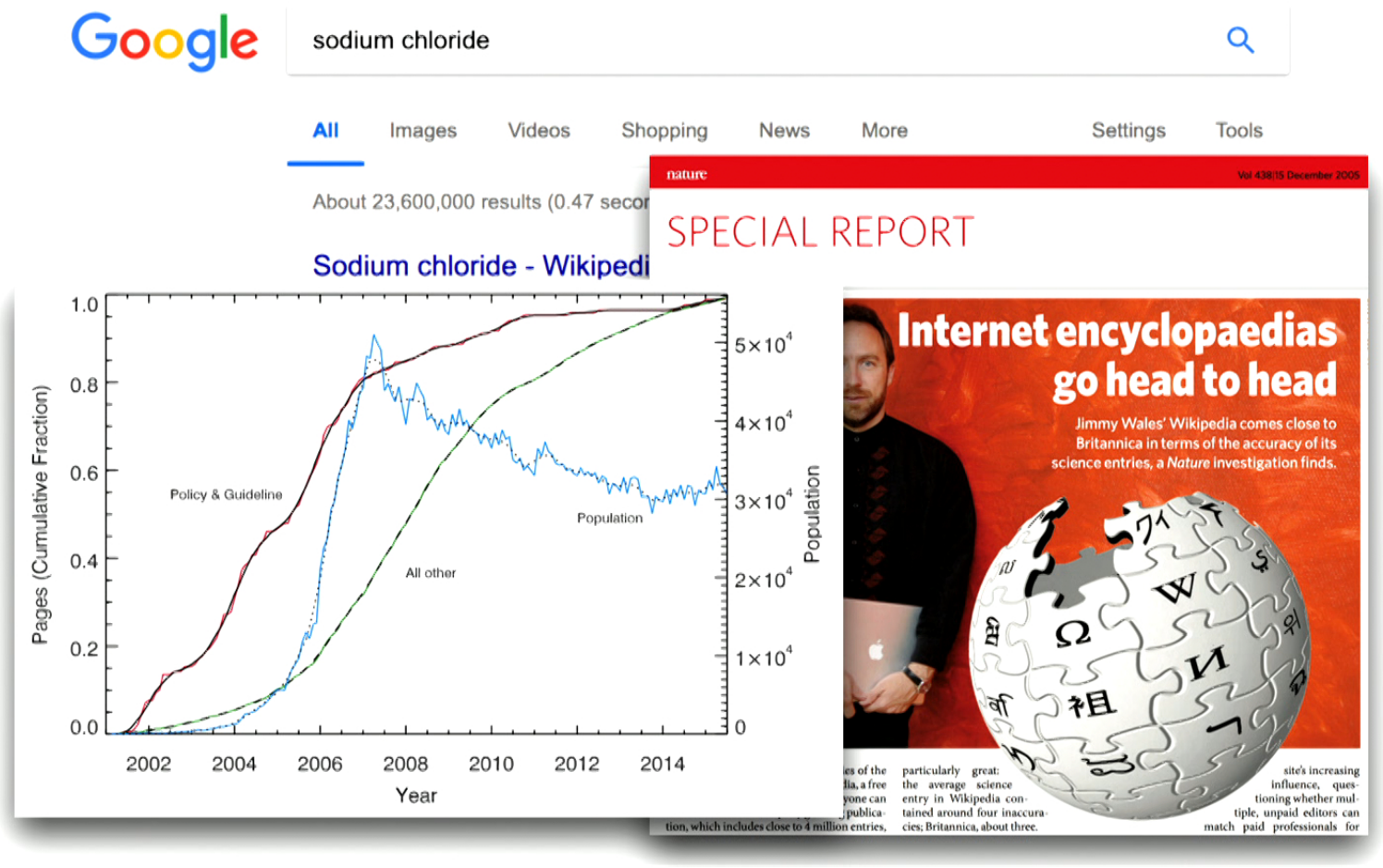
Beyond-System Common Knowledge



Beyond-System Common Knowledge

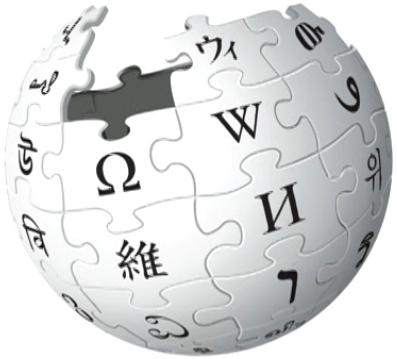


Beyond-System Common Knowledge



Lessons from the past

"the encyclopedia that everyone can edit"



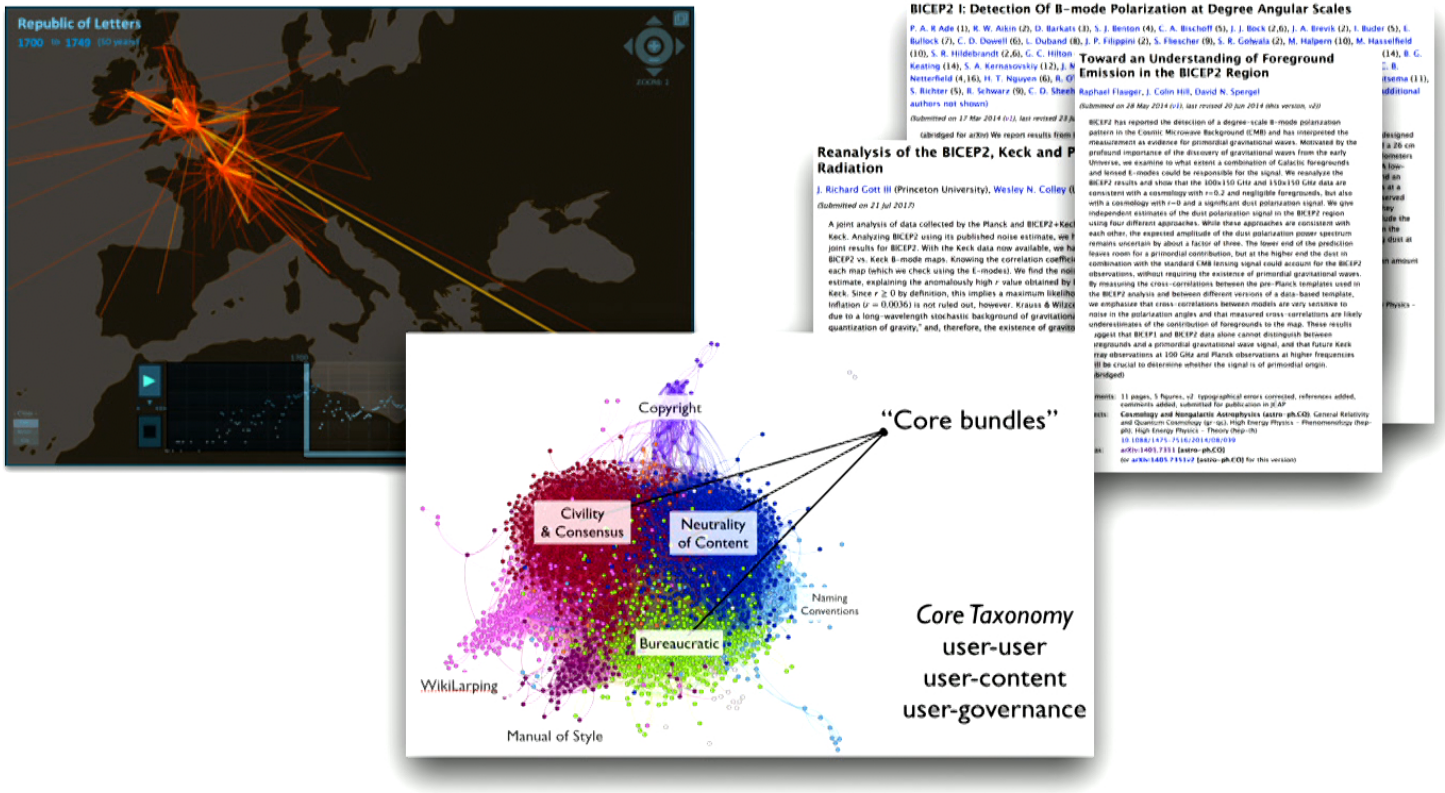
WIKIPEDIA
The Free Encyclopedia

Mottos (not constitutions) Matter

Lessons from the past

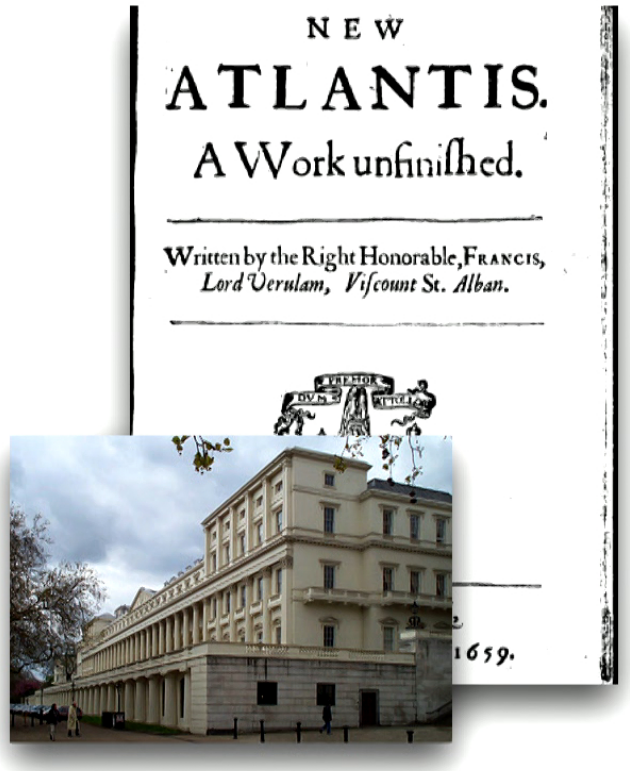
Norms (not rules!) Matter

Lessons from the past



Norms (not rules!) Matter

Lessons from the past


NEW
ATLANTIS.
A Work unfinished.

Written by the Right Honorable, FRANCIS,
Lord Verulam, Viscount St. Alban.

1659.


No. 4356 April 25, 1953 NATURE 737

equipment, and to Dr. G. E. H. Duncan and the captain and officers of H.B.S. *Discovery II* for their part in making the observations.

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

A Structure for Deoxyribose Nucleic Acid

WE wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey[1]. They kindly made their manuscript available to us in advance of publication. Their model consists of three inter-twined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for

is a residue on each chain every 3·4 A. in the z-direction. We have assumed an angle of 36° between adjacent residues in the same chain, so that the structure repeats after 10 residues on each chain, that is, after 34 A. The distance of a phosphorus atom from the fibre axis is 10 A. As the phosphates are on the outside, cations have easy access to them.

The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical z-co-ordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on these assumptions the other member must be thymine; similarly for guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain is given, then the sequence on the other chain is automatically determined.

It has been found experimentally[3,4] that the ratio

Myths (not PR) Matter

Open Science in the Fourth Square

Open Science in the Fourth Square

	Motto	Myth	Norms
Data Mist	All knowledge is one	"The colleague down the hall"	Metadata; reliability; trust
Blockchain Republic	Save everything	"The lost archive"	Completeness; iteration; validation; forgiveness

Open Science in the Fourth Square

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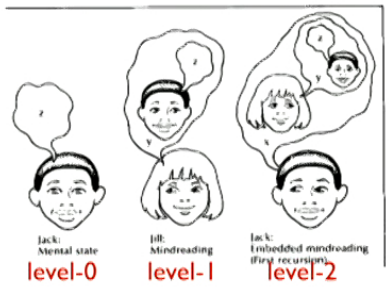
Moon Shot	Falsify or Integrate	Asimov's Foundation	Collaboration; ambition; demo or die

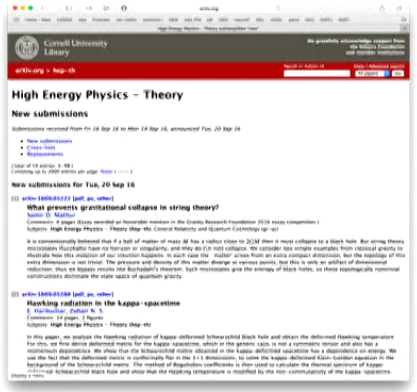
without-which-nothing norms:
reputation, not prestige; priority and citation; *ad hoc*

Open Science in the Fourth Square

Teach your children well

Will this begin with graduate students?





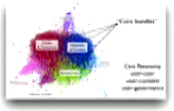
The Fourth Square

	Small	Large
Authoritarian	Classroom	Royal Society, Scientific Journal, arXiv,…
Decentralized	Seminar	arXiv, Republic of Letters, …?

Within-System Common Knowledge
Lessons from Wikipedia

Same page, not same paragraph

"the encyclopedia that everyone can edit"



Reputation, not status

ad hoc, not *a priori*

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