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***Time has shown us how zero control** by a handful of individuals over the society and complete control of the community, as a whole, over itself brings about positive changes. Less the control by individuals or groups and more the control of the complete set of individuals, more is the positive change. The history of the printing press is a case in point. While history made a mockery of the control-freaks, it proved right the few individuals, who believed in the intellectual capacity of the masses. **Intellectual Nazism** should be a thing of the past and we should move away from such self-defeating practices.*

As more and more researchers embrace Open practices, irrespective of the influence of any kind of authority and affiliations, a new free world of debate and discussions will truly open up.

*In the words of Erasmus, a Latin scholar and a Catholic reformer, 'To what corner of the world do they not fly, these swarms of new books? It may be that one here and one there contributes something worth knowing, but the very multitude of them is **hurtful to scholarship**, because it creates a glut, and even in good things, satiety is most harmful… (printers) fill the world with books, not just trifling things (such as I write, perhaps), but stupid, ignorant, slanderous, scandalous, raving, irreligious and seditious books, and the number of them is such that even the valuable publications lose their value.'*

***Erasmus's fear pretty much sums up the apprehensions of today's 'intellectual elites' and 'printing powerhouses'. In todays world too, the Internet has brought about a transformation of the society.** This is a tool that can be used for free dissemination of knowledge and of research. However, a few people even today tend to believe that free dissemination of research (that results in free and fair debates and discussions of the works) would bring about a 'end of the world' situation for science. They are of the opinion that they ought to have as much control as possible over the dissemination of research works in order to keep the flag of science flying. **These handful of people have the audacity to believe that they must be the 'chosen ones' to boss over the whole of the scientific community.** These are the people who oppose **Open Science and Open Knowledge movements**.*

- See more at: http://in.okfn.org/open-science-project/

Relation Between Medieval Renaissance and Today's Open Knowledge Dissemination

Subhajit Ganguly

Description

Time has shown us how zero control by a handful of individuals over the society and complete control of the community, as a whole, over itself brings about positive changes. Less the control by individuals or groups and more the control of the complete set of individuals, more is the positive change. The history of the printing press is a case in point. While history made a mockery of the control-freaks, it proved right the few individuals, who believed in the intellectual capacity of the masses. Intellectual Nazism should be a thing of the past and we should move away from such self-defeating practices.

Cite as:

Relation Between Medieval Renaissance and Today's Open Knowledge Dissemination . Subhajit Ganguly. fig**share**.
http://dx.doi.org/10.6084/m9.figshare.729275

Retrieved 23:39, Aug 07, 2013 (GMT)
Read full version at : Paper

Condensation States and Landscaping with the Theory of Abstraction

Subhajit Ganguly

Description

The Abstraction theory is applied in landscaping. A collection of objects may be made to be vast or meager depending upon the scale of observations. This idea may be developed to unite the worlds of the great vastness of the universe and the minuteness of the sub-atomic realm. Keeping constant a scaling ratio for both worlds, these may actually be converted into two self-same representatives with respect to scaling. The Laws of Physical Transactions are made use of to study Bose-Einstein condensation. As the packing density of concerned constituents increase to a certain critical value, there may be evolution of energy from the system.

Cite as:

Condensation States and Landscaping with the Theory of Abstraction . Subhajit Ganguly. figshare.

http:/dx.doi.org/10.6084/m9.figshare/91658

Retrieved 00:00, Aug 07, 2013 (GMT)

Read full version at : Paper

Star formation and black hole growth at z=4.8

Hagai Netzer, Rivay Mor, Benny Trakhtenbrot, Ohad Shemmer, Paulina Lira

Description

We report Herschel/SPIRE Spitzer and Wise observations of 44 z=4.8 optically selected active galactic nuclei (AGNs). This flux limited sample contains the highest mass black holes (BHs) at this redshift. Ten of the objects were detected by Herschel with star formation (SF) luminosity (LSF, integrated over 8-1000 mic) in the range 10^(46.70)-10^(47.21) erg/s corresponding to SF rates of 1310-4240 Msun/yr. Stacking analysis of 29 undetected sources gives a significant signal corresponding to LSF=10^(46.23) erg/s. The remaining 5 sources show emission that is not clearly associated with the AGNs. The mean BH mass (mbh) and associated AGN luminosity (LAGN) of the detected sources are significantly higher than those of the undetected sources. The luminosity differences are seen from rest-frame 900A all the way to the far infrared. The mean optical-UV spectra of the two groups are similar to the spectrum of standard accretion disks around BHs with the measured masses and accretion rates. The Herschel data are consistent with the idea that the detected sources are above the SF mass sequence (MS) at z=4.8, perhaps in mergers, and most of the undetected sources are on the MS. We suggest two alternative explanations to the correlation of LSF, LAGN and mbh, one involving no AGN feedback and the second a moderate feedback that affects, but not totally quench SF in about 3/4 of the sources. We discuss the LSF-LAGN correlation in comparison to lower redshift samples and show a new correlation between LSF and mbh. We also follow the build-up of stellar and BH mass from z=4.8 to z=2.4 and derive accretion and SF duty cycles under various conditions.

Cite as:

arXiv:1308.0012 [astro-ph.CO]
(or arXiv:1308.0012v2 [astro-ph.CO] for this version)

Read full version at : Paper

Polarization Enhancement in Perovskite Superlattices by Oxygen Octahedral Tilts

X. Z. Lu, X. G. Gong, H. J. Xiang

Description

Interface engineering in perovskite oxide superlattices has developed into a flourishing field, enabling not only further tuning of the exceptional properties, but also giving access to emergent physical phenomena. Here, we reveal a new mechanism for enhancing the electric polarization by the interfacial oxygen octahedral tilts in BaTiO3/CaTiO3 superlattices. By combining a novel genetic algorithm with density functional theory (DFT), we predict that the true ground states in 1:1 and 2:2 BaTiO3/CaTiO3 superlattices grown on SrTiO3 adopt the Pc symmetry with a large electric polarization (32.7{\mu}C/cm2 for 1:1 and 34.0 {\mu}C/cm2 for 2:2 superlattices), which is even larger than that of bulk BaTiO3. The tilt of oxygen octahedron is found to play a key role for the enhancement of out-of-plane polarization because it reduces greatly the rotation of oxygen octahedron which significantly suppresses the out-of-plane polarization.

Cite as: arXiv:1308.0076 [cond-mat.mtrl-sci]

(or arXiv:1308.0076v1 [cond-mat.mtrl-sci] for this version)

Read full version at : Paper

Hamiltonian Dynamics in the Theory of Abstraction

Subhajit Ganguly

Description

This paper deals with fluid flow dynamics which may be Hamiltonian in nature and yet chaotic.Here we deal with sympletic invariance, canonical transformations and stability of such Hamiltonian flows. As a collection of points move along, it carries along and distorts its own

neighbourhood. This in turn affects the stability of such flows.

Cite as:
Hamiltonian Dynamics in the Theory of Abstraction. Subhajit Ganguly. fig**share**.

http://dx.doi.org/10.6084/m9.figshare.91659

Read full version at : Paper

Physical And Relational Networks In The Aegean Bronze Age

- **Tim Evans, Ray Rivers, Carl Knappett**

Description

In this paper we present a new interdisciplinary perspective on regional interaction patterns in archaeological contexts. It combines insights from graph theory, social network analysis and statistical physics to treat the interactions between sites in geographical space in terms of a network which minimises an associated Hamiltonian. To explore the various issues involved a case study from a heterogeneous physical environment is chosen, the archipelago environment of the southernAegean, in particular the rich dataset of the Aegean Bronze Age. Our findings are of broader relevance for the study of interaction networks, as the use of statistical physics in this fashion represents a novel application in social science contexts.
Cite as:

Physical And Relational Networks In The Aegean Bronze Age. Tim Evans, Ray Rivers, Carl Knappett. figshare.

http://dx.doi.org/10.6084/m9.figshare.750447

Read full version at : Paper

Monte Carlo simulation of classical spin models with chaotic billiards

Hideyuki Suzuki

Description

It has recently been shown that the computing abilities of Boltzmann machines, or Ising spin-glass models, can be implemented by chaotic billiard dynamics without any use of random numbers. In this paper, we further numerically investigate the capabilities of the chaotic billiard dynamics as a deterministic alternative to random Monte Carlo methods by applying it to classical spin models in

statistical physics. First, we verify that the billiard dynamics can yield samples that converge to the true distribution of the Ising model on a small lattice, and we show that it appears to have the same convergence rate as random Monte Carlo sampling. Second, we apply the billiard dynamics to finite-size scaling analysis of the critical behavior of the Ising model and show that the phase transition point and the critical exponents are correctly obtained. Third, we extend the billiard dynamics to spins that take more than two states and show that it can be applied successfully to the Potts model. We also discuss the possibility of extensions to continuous-valued models such as the XY model.

Cite as:

arXiv:1308.0660 [cond-mat.stat-mech]

(or arXiv:1308.0660v1 [cond-mat.stat-mech] for this version)

Read full version at : Paper

Schrödinger Equation on Fractals Curves Imbedding in R^3

Alireza Khalili Golmankhaneh, Ali Khalili Golmankhaneh, Dumitru Baleanu

Description:

In this paper we have generalized the quantum mechanics on fractal time-space. The time is changing on Cantor-set like but space is considered as fractal curve like Von-Koch curve. The Feynman path method in quantum mechanics has been suggested on fractal curve. Using F^{α}-calculus and Feynman path method we found the Schr\"{e}dinger on fractal time-space. The Hamiltonian operator and momentum operator has been derived. More, the continuity equation and the probability density is given in generalized formulation.

Cite as: arXiv:1308.0291 [math-ph]
(or arXiv:1308.0291v1 [math-ph] for this version)

Read full version at : Paper

Dirac operators on noncommutative curved spacetimes

Alexander Schenkel, Christoph F. Uhlemann

Description:

We study Dirac operators in the framework of twist-deformed noncommutative geometry. The definition of noncommutative Dirac operators is not unique and we focus on three different ones, each generalizing the commutative Dirac operator in a natural way. We show that the three definitions are mutually inequivalent, and that demanding formal self-adjointness with respect to a suitable inner product singles out a preferred choice. A detailed analysis shows that, if the Drinfeld twist contains sufficiently many Killing vector fields, the three operators coincide, which can simplify explicit calculations considerably. We then turn to the construction of quantized Dirac fields on noncommutative curved spacetimes. We show that there exist unique retarded and advanced Green's operators and construct a canonical anti-commutation relation algebra. In the last part we study noncommutative Minkowski and AdS spacetimes as explicit examples.

Cite as: arXiv:1308.1929 [hep-th] (or arXiv:1308.1929v1 [hep-th] for this version)

Read full version at : Paper

Intrinsic Charm Parton Distribution Functions from CTEQ-TEA Global Analysis

Sayipjamal Dulat, Tie-Jiun Hou, Jun Gao, Joey Huston, Jon Pumplin, Carl Schmidt, Daniel Stump, C.-P. Yuan

Description:

We study the possibility of intrinsic (non-perturbative) charm in parton distribution functions (PDF) of the proton, within the context of the CT10 next-to-next-to-leading order (NNLO) global analysis. Three models for the intrinsic charm (IC) quark content are compared: (i) $\hat{c}(x) = 0$ (zero-IC model); (ii) $\hat{c}(x)$ is parametrized by a valence-like parton distribution (BHPS model); (iii) $\hat{c}(x)$ is parametrized by a sea-like parton distribution (SEA model). In these models, the intrinsic charm content, $\hat{c}(x)$, is included in the charm PDF at the matching scale $Q_c=m_c=1.3$ GeV. The best fits to data are constructed and compared. Correlations between the value of m_c and the amount of IC are also considered.

Cite as: arXiv:1309.0025 [hep-ph] (or arXiv:1309.0025v1 [hep-ph] for this version)

Aaron Swartz original manifesto

Guerilla Open Access Manifesto

Information is power. But like all power, there are those who want to keep it for themselves. The world's entire scientific and cultural heritage, published over centuries in books and journals, is increasingly being digitized and

locked up by a handful of private corporations. Want to read the papers featuring the most famous results of the sciences? You'll need to send enormous amounts to publishers like Reed Elsevier.

There are those struggling to change this. The Open Access Movement has fought valiantly to ensure that scientists do not sign their copyrights away but instead ensure their work is published on the Internet, under terms that allow anyone to access it. But even under the best scenarios, their work will only apply to things published in the future. Everything up until now will have been lost. That is too high a price to pay. Forcing academics to pay money to read the work of their colleagues? Scanning entire libraries but only allowing the folks at Google to read them? Providing scientific articles to those at elite universities in the First World, but not to children in the Global South? It's outrageous and unacceptable.

"**I agree," many say, "but what can we do? The companies hold the copyrights, they make enormous amounts of money by charging for access, and it's perfectly legal – there's nothing we can do to stop them." But there is something we can, something that's already being done: we can fight back. Those with access to these resources – students, librarians, scientists – you have been given a privilege. You get to feed at this banquet of knowledge while the rest of the world is locked out. But you need not – indeed, morally, you cannot – keep this privilege for yourselves. You have a duty to share it with the world. And you have: trading passwords with colleagues, filling download requests for friends.**

Meanwhile, those who have been locked out are not standing idly by. You have been sneaking through holes and climbing over fences, liberating the information locked up by the publishers and sharing them with your friends. But all of this action goes on in the dark, hidden underground. It's called stealing or piracy, as if sharing a wealth of knowledge were the moral equivalent of plundering a ship and murdering its crew. But sharing isn't

immoral – it's a moral imperative. Only those blinded by greed would refuse to let a friend make a copy.

Large corporations, of course, are blinded by greed. The laws under which they operate require it – their shareholders would revolt at anything less. And the politicians they have bought off back them, passing laws giving them the exclusive power to decide who can make copies. There is no justice in following unjust laws. It's time to come into the light and, in the grand tradition of civil disobedience, declare our opposition to this private theft of public culture.

We need to take information, wherever it is stored, make our copies and share them with the world. We need to take stuff that's out of copyright and add it to the archive. We need to buy secret databases and put them on the Web. We need to download scientific journals and upload them to file sharing networks. We need to fight for Guerilla Open Access. With enough of us, around the world, we'll not just send a strong message opposing the privatization of knowledge – we'll make it a thing of the past. Will you join us?

Aaron Swartz

July 2008, Eremo, Italy

Asymptotically log Fano varieties

Ivan A. Cheltsov, Yanir A. Rubinstein

Description:

Motivated by the study of Fano type varieties we define a new class of log pairs that we call asymptotically log Fano varieties and strongly asymptotically log Fano varieties. We study their properties in dimension two under an additional assumption of log smoothness, and give a complete classification of two dimensional strongly asymptotically log smooth log Fano

varieties. Based on this classification we formulate an asymptotic logarithmic version of Calabi's conjecture for del Pezzo surfaces for the existence of K\"ahler–Einstein edge metrics in this regime. We make some initial progress towards its proof by demonstrating some existence and non-existence results, among them a generalization of Matsushima's result on the reductivity of the automorphism group of the pair, and results on log canonical thresholds of pairs. One by-product of this study is a new conjectural picture for the small angle regime and limit which reveals a rich structure in the asymptotic regime, of which a folklore conjecture concerning the case of a Fano manifold with an anticanonical divisor is a special case.

Cite as: arXiv:1308.2503 [math.AG] (or arXiv:1308.2503v1 [math.AG] for this version)

Read full version at : Paper

Quantum Energy Teleportation between Spin Particles in a Gibbs State

Michael Frey, Karl Gerlach, Masahiro Hotta

Description:

Energy in a multipartite quantum system appears from an operational perspective to be distributed to some extent non-locally because of correlations extant among the system's components. This non-locality allows users to transfer, in effect, locally accessible energy between sites of different system components by LOCC (local operations and classical communication). Quantum energy teleportation is a three-step LOCC protocol, accomplished without an external energy carrier, for effectively transferring energy between two physically separated, but correlated, sites. We apply this LOCC teleportation protocol to a model Heisenberg spin particle pair initially in a quantum thermal Gibbs state, making temperature an explicit parameter. We find in this setting that

energy teleportation is possible at any temperature, even at temperatures above the threshold where the particles' entanglement vanishes. This shows for Gibbs spin states that entanglement is not fundamentally necessary for energy teleportation; correlation other than entanglement can suffice. Dissonance—quantum correlation in separable states—is in this regard shown to be a quantum resource for energy teleportation, more dissonance being consistently associated with greater energy yield. We compare energy teleportation from particle A to B in Gibbs states with direct local energy extraction by a general quantum operation on B and find a temperature threshold below which energy extraction by a local operation is impossible. This threshold delineates essentially two regimes: a high temperature regime where entanglement vanishes and the teleportation generated by other quantum correlations yields only vanishingly little energy relative to local extraction and a second low-temperature teleportation regime where energy is available at B only by teleportation.

Cite as: arXiv:1305.5853 [quant-ph] (or arXiv:1305.5853v2 [quant-ph] for this version)

Read full version at : Paper

A Study of the Indus Signs

Subhajit Ganguly

Description:

Considering the fact that the Harappan script may have been proto-Brahmi, the underlying language to be expected should be Sanskrit, or proto-Sanskrit, or derivatives of Sanskrit. Many of the rules of evolution that apply to scripts are equivalently true for languages too. Like scripts, languages too render themselves to similar evolutionary inspections, as they too carry imprints of their journey down the ages.

Cite as: A Study of the Indus Signs. Subhajit Ganguly. fig**share**

http://dx.doi.org/10.6084/m9.figshare.446907

Read full version at : Paper

Validation of the cuIBM code for Navier-Stokes equations with immersed boundary methods

- Anush Krishnan, Lorena A. Barba

Description:

We have developed a Navier-Stokes solver, called cuIBM, to simulate incompressible flows using immersed boundary methods. This document provides background on the numerical methods implemented in the cuIBM code framework and evidence of the validation exercise carried out by the authors. The code provides a growing set of options for flows with immersed boundaries, is written in C++ and uses GPU hardware via CUDA kernels and calls to the Cusp library. The validation tests in two-dimensions use an analytical solution (Couette flow) and several experimental results to contrast with the numerical solutions. The experimental benchmarks include a lid-driven cavity at Re=100, impulsively started flow around a circular cylinder at low and moderate Reynolds numbers, cylinder wake flow, and flow over both heaving and flapping airfoils.

Cite as: Validation of the cuIBM code for Navier-Stokes equations with immersed boundary methods. Anush Krishnan, Lorena A. Barba. fig**share**

http://dx.doi.org/10.6084/m9.figshare.92789

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The Projects We Started This Year Are Rolling Smoothly Now

The Open Education Project

Started a few months back, this project now boasts a long list of books and educational materials. All contents are licensed under **CC-BY**, enabling smooth sharing of the works. India has around 30 major languages and we have a long way to go before we have a comprehensive collection of educational materials in all these vernacular languages. However, things are already looking up as we have started to get content in the regional languages too. We are about to take the project to the next level by starting a system of publishing original content from authors.

Open Data Project

In India, there is a lot of scope for involvement of the masses in order to work towards making

ourselves a better managed nation. Constitutional instruments like the Public Interest Litigation (PIL), the Right To Information (RTI), etc., lose their relevance without complete transparency in the dissemination of government as well as non-government data. Building a mass-based system of knowledge-banks can help us a lot in achieving our goal. We can assist the governments for making more information public, wherever necessary.

Open Science and Research Project

We are working to implement Open Access to all research done and have built a large community of supporters. Open Access India has probed to be a major success in spreading the word. However, we have still a long way to go. Our aim is not only Open Access but Open Research. In near future, we have a few plans that we would like to implement regarding this. OKFN, India is with Creative Commons (CC) now: **Click Here** to know more.

Single-shot readout of a superconducting flux qubit with a flux-driven Josephson parametric amplifier

Z. R. Lin, K. Inomata, W. D. Oliver, K. Koshino, Y. Nakamura, J. S. Tsai, T. Yamamoto

Description:

Energy in a multipartite quantum system appears from an operational perspective to be distributed to some extent non-locally because of correlations extant among the system's components. This non-locality allows users to transfer, in effect, locally accessible energy between sites of different system components by LOCC (local operations and classical communication). Quantum energy teleportation is a three-step LOCC protocol, accomplished without an external energy carrier, for effectively transferring energy between two physically separated, but correlated, sites. We apply this LOCC teleportation protocol to a model Heisenberg spin particle pair initially in a quantum thermal Gibbs state, making temperature an explicit parameter. We find in this setting that energy teleportation is possible at any temperature, even at temperatures above the threshold where the particles' entanglement vanishes. This shows for Gibbs spin states that entanglement is not fundamentally necessary for energy teleportation; correlation other than entanglement can suffice. Dissonance—quantum correlation in separable states—is in this regard shown to be a quantum resource for energy teleportation, more dissonance being consistently associated with greater energy yield. We compare energy teleportation from particle A to B in Gibbs states with direct local energy extraction by a general quantum operation on B and find a temperature threshold below which energy extraction by a local operation is impossible. This threshold delineates essentially two regimes: a high temperature regime where entanglement vanishes and the teleportation generated by other quantum correlations yields only vanishingly little energy relative to local extraction and a second low-temperature teleportation regime where energy is available at B only by teleportation.

Cite as: arXiv:1309.6706 [cond-mat.supr-con]
(or arXiv:1309.6706v1 [cond-mat.supr-con] for this version)

Read full version at : Paper

Spike Synchronization Dynamics of Small-World Networks

Derek Harter

Description:

In this research report, we examine the effects of small-world network organization on spike synchronization dynamics in networks of Izhikevich spiking units. We interpolate network organizations from regular ring lattices, through the small-world region, to random networks, and measure global spike synchronization dynamics. We examine how average path length and clustering effect the dynamics of global and neighborhood clique spike organization and propagation. We show that the emergence of global synchronization undergoes a phase transition in the small-world region, between the clustering and path length phase transitions that are known to exist. We add additional realistic constraints on the dynamics by introducing propagation delays of spiking signals proportional to wiring length. The addition of delays interferes with the ability of random networks to sustain global synchronization, in relation to the breakdown of clustering in the networks. The addition of delays further enhances the finding that small-world organization is beneficial for balancing neighborhood synchronized waves of organization with global synchronization dynamics.

Cite as: arXiv:1309.5660 [cs.NE]

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(or arXiv:1309.5660v1 [cs.NE] for this version)

On Similarity and Entropy of Neutrosophic Sets

Pinaki Majumdar, S. K. Samanta

Description:

In this paper we have introduced the notion of distance between two single valued neutrosophic sets and studied its properties. We have also defined several similarity measures between them and investigated their characteristics. A measure of entropy of a single valued neutrosophic set has also been introduced.

Cite as: **http://vixra.org/abs/1309.0128**

Intrinsic Charm Parton Distribution Functions from CTEQ-TEA Global Analysis

Sayipjamal Dulat, Tie-Jiun Hou, Jun Gao, Joey Huston, Jon Pumplin, Carl Schmidt, Daniel Stump, C.-P. Yuan

Description:

We study the possibility of intrinsic (non-perturbative) charm in parton distribution functions (PDF) of the proton, within the context of the CT10 next-to-next-to-leading order (NNLO) global analysis. Three models for the intrinsic charm (IC) quark content are compared: (i) $\hat{c}(x) = 0$ (zero-IC model); (ii) $\hat{c}(x)$ is parametrized by a valence-like parton distribution (BHPS model); (iii) $\hat{c}(x)$ is parametrized by a sea-like parton distribution (SEA model). In these models, the intrinsic charm content, $\hat{c}(x)$, is included in the charm PDF at the matching scale $Q_c=m_c=1.3$ GeV. The best fits to data are constructed and compared. Correlations between the value of m_c and the amount of IC are also considered.

Cite as: arXiv:1309.0025 [hep-ph]
(or arXiv:1309.0025v1 [hep-ph] for this version)