



Research Vitality Platform

November, 2013



Open Knowledge Foundation Network, India : Open Science and Research Project

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The Vitayard Research Platform took an infant step in October, when it first started its bold march in the world of Open Science and Research. **In its second issue, it takes the cause further** and presents an even bigger collection of research articles appearing in various repositories.

Each of these items were chosen depending upon various factors that include novelty of idea, breakthrough in techniques, contribution to the respective fields, etc. The idea is fast becoming popular among researchers as an alternative method of dissemination of research.

In days to come, we hope to take Vitayard forward in achieving the true spirit of **not only Open Access but Open Research**. Sharing research openly is a responsibility that researchers simply cannot escape today. Repositories that are Open Access can take care of that. Scavenging Systems like Vitayard can publish research that appear in such repositories. They can take in submissions from researchers directly, as well.

PALAEO-ICE STREAMS IN THE NORTH-EASTERN LAURENTIDE ICE SHEET

Hernán De Angelis

Description:

This thesis presents a palaeoglaciological study aimed to determine the location, geometry and temporal evolution of palaeo-ice streams of the north-easternmost Laurentide Ice Sheet. The work was accomplished through the geomorphological interpretation of satellite imagery over 3.19×10^6 km² of the Canadian Arctic, using a glaciological inversion scheme. Ice streams were active in this region during most of the time between the Last Glacial Maximum and the last deglaciation. A web of ice streams and inter-ice stream areas existed. Three major ice stream networks are identified: the M'Clintock Channel, Gulf of Boothia – Lancaster Sound and Hudson Strait. The M'Clintock Channel bears the most complex landform record, comprising three generations of palaeo-ice streams. Their location was weakly controlled by the subglacial topography and their geometry was determined by frozen-bed portions of the ice sheet, thus providing evidence for pure ice streams in the Laurentide Ice Sheet. In contrast, the more pronounced relief of the Gulf of Boothia – Lancaster Sound corridor supported topographically controlled ice streams. The landform record on emerged land along Hudson Strait is insufficient to support the existence of ice streams. It is therefore proposed that ice streams were constrained within the deep parts of the strait while flanked by cold-based zones on the margins. Small transient ice streams on Baffin and Prince of Wales islands drained local remnant ice caps during the collapse of the ice sheet. Analysis of the controls on the location and flow of palaeo-ice streams suggests that the interaction between the subglacial topography and thermal state of the substrate plays a more fundamental role than the geology. It is concluded that the behaviour of ice streams cannot be explained in terms of environmental controls alone, but the complex dynamics of ice stream shear margins and onset zones must be considered.

Cite as:

PALAEO-ICE STREAMS IN THE NORTH-EASTERN LAURENTIDE ICE SHEET.

Hernán De Angelis. figshare

<http://dx.doi.org/106084/m9.figshare.825392>

How Plasma Composition affects the relativistic flows and the emergent spectra

Indranil Chattopadhyay, Sudip Garain, Himadri Ghosh

Description:

It has been recently shown that transonic electron positron fluid is the least relativistic, compared to the fluid containing finite proportion of baryons. We compute spectra from these flows in general relativity (GR) including the effect of light bending. We consider the bremsstrahlung process to supply the seed photons. We choose accretion in the advective domain, and for simplicity the radial accretion or Bondi type accretion. We show that electron positron accreting flow produces the softest spectra and the lowest luminosity.

Cite as:

[arXiv:1310.0138](https://arxiv.org/abs/1310.0138) [astro-ph.HE]

(or [arXiv:1310.0138v1](https://arxiv.org/abs/1310.0138v1) [astro-ph.HE] for this version)

The HAWC Gamma-Ray Observatory: Sensitivity to Steady and Transient Sources of Gamma Rays

HAWC Collaboration: A. U. Abeysekara, R. Alfaro, C. Alvarez, J. D. Álvarez, R. Arceo, J. C. Arteaga-Velázquez, H. A. Ayala Solares, A. S. Barber, B. M. Baughman, N. Bautista-Elivar, E. Belmont, S. Y. BenZvi, D. Berley, M. Bonilla Rosales, J. Braun, R. A. Caballero-Lopez, K. S. Caballero-Mora, A. Carramiñana, M. Castillo, U. Cotti, J. Cotzomi, E. de la Fuente, C. De León, T. DeYoung, R. Diaz Hernandez, J. C. Díaz-Vélez, B. L. Dingus, M. A. DuVernois, R. W. Ellsworth, A. Fernandez, D. W. Fiorino, N. Fraija, A. Galindo, F. Garfias, L. X. González, M. M. González, J. A. Goodman, V. Grabski, M. Gussert, Z. Hampel-Arias, C. M. Hui, P. Hüntemeyer, A. Imran, A. Iriarte, P. Karn, D. Kieda, G. J. Kunde, A. Lara, R. J. Lauer, W. H. Lee, D. Lennarz, H. León Vargas, E. C. Linares, J. T. Linnemann, M. Longo, R. Luna-García, A. Marinelli, H. Martinez, O. Martinez, J. Martínez-Castro, J. A. J. Matthews, P. Miranda-Romagnoli, E. Moreno, M. Mostafá, J. Nava, L.

Nellen, M. Newbold, R. Noriega-Papaqui, T. Ocegüera-Becerra, B. Patricelli, R. Pelayo, E. G. Pérez-Pérez, J. Pretz, C. Rivière, D. Rosa-González, H. Salazar, F. Salesa, F. E. Sanchez, A. Sandoval, E. Santos, M. Schneider, S. Silich, G. Sinnis, A. J. Smith, K. Sparks, R. W. Springer, I. Taboada, P. A. Toale, K. Tollefson, I. Torres, T. N. Ukwatta, L. Villaseñor, T. Weisgarber, S. Westerhoff, I. G. Wisher, J. Wood, G. B. Yodh, P. W. Younk, D. Zaborov, A. Zepeda, H. Zhou

Description:

The High-Altitude Water Cherenkov (HAWC) Gamma-Ray Observatory is designed to record air showers produced by cosmic rays and gamma rays between 100 GeV and 100 TeV. Because of its large field of view and high livetime, HAWC is well-suited to measure gamma rays from extended sources, diffuse emission, and transient sources. We describe the sensitivity of HAWC to emission from the extended Cygnus region as well as other types of galactic diffuse emission; searches for flares from gamma-ray bursts and active galactic nuclei; and the first measurement of the Crab Nebula with HAWC-30.

Cite as:

[arXiv:1310.0071](https://arxiv.org/abs/1310.0071) [astro-ph.HE]

(or [arXiv:1310.0071v1](https://arxiv.org/abs/1310.0071v1) [astro-ph.HE] for this version)

Measurement-based Quantum Computation Under Different Types of Noises

Ding Zhong, Jian Wang, Ning Dai, Liang-Zhu Mu, Heng Fan

Description:

Measurement based quantum computation (MBQC) is an effective paradigm for universal quantum computation. In this scheme, the universal set of quantum gates are realized by only local measurements on the prior prepared cluster states. The inevitable decoherence is harmful to the realization of those quantum gates. Here, we investigate the performance of the quantum gates exposed to different type of noises. We find that some errors may not influence the success of the quantum gates, in contrast, some others may destroy their realization. We show that there is a controlling pattern that can protect quantum gates from certain types of noises and thus can improve the success probability of the gates implementation.

Cite as:

[arXiv:1310.0228](https://arxiv.org/abs/1310.0228) [quant-ph]

(or [arXiv:1310.0228v3](https://arxiv.org/abs/1310.0228v3) [quant-ph] for this version)

[The squashed entanglement of a quantum channel](#)

Masahiro Takeoka, Saikat Guha, Mark M. Wilde

Description:

This paper defines the squashed entanglement of a quantum channel as the maximum squashed entanglement that can be registered by a sender and receiver at the input and output of a quantum channel, respectively. A new subadditivity inequality for the original squashed entanglement measure of Christandl and Winter leads to the conclusion that the squashed entanglement of a quantum channel is an additive function of a tensor product of any two quantum channels. More importantly, this new subadditivity inequality, along with prior results of Christandl, Winter, et al., establishes the squashed entanglement of a quantum channel as an upper bound on the quantum communication capacity of any channel assisted by unlimited forward and backward classical communication. A similar proof establishes this quantity as an upper bound on the private capacity of a quantum channel assisted by unlimited forward and backward public classical communication. This latter result is relevant as a limitation on rates achievable in quantum key distribution. As an important application, we determine that these capacities can never exceed $\log((1+\eta)/(1-\eta))$ for a pure-loss bosonic channel for which a fraction η of the input photons make it to the output on average. The best known lower bound on these capacities is equal to $\log(1/(1-\eta))$. Thus, in the high-loss regime for which $\eta \ll 1$, this new upper bound demonstrates that the protocols corresponding to the above lower bound are nearly optimal.

Cite as:

[arXiv:1310.0129](https://arxiv.org/abs/1310.0129) [quant-ph]

(or [arXiv:1310.0129v2](https://arxiv.org/abs/1310.0129v2) [quant-ph] for this version)

[The Jeffreys-Lindley Paradox and Discovery Criteria in High Energy Physics](#)

Robert D. Cousins

Description:

The Jeffreys-Lindley paradox displays how the use of a p-value (or number of standard deviations z) in a frequentist hypothesis test can lead to inferences that are radically different from those of a Bayesian hypothesis test in the form advocated by Harold Jeffreys in the 1930's and common today. The setting is the test of a point null (such as the Standard Model of elementary particle physics) versus a composite alternative (such as the Standard Model plus a new force of nature with unknown strength). The p-value, as well as the ratio of the likelihood under the null to the maximized likelihood under the alternative, can both strongly disfavor the null, while the Bayesian posterior

probability for the null can be arbitrarily large. The professional statistics literature has many impassioned comments on the paradox, yet there is no consensus either on its relevance to scientific communication or on the correct resolution. I believe that the paradox is quite relevant to frontier research in high energy physics, where the model assumptions can evidently be quite different from those in other sciences. This paper is an attempt to explain the situation to both physicists and statisticians, in hopes that further progress can be made.

Cite as:

[arXiv:1310.3791](https://arxiv.org/abs/1310.3791) [stat.ME]

(or [arXiv:1310.3791v1](https://arxiv.org/abs/1310.3791v1) [stat.ME] for this version)

Efficient Monte Carlo and greedy heuristic for the inference of stochastic block models

Tiago P. Peixoto

Description:

We present an efficient algorithm for the inference of stochastic block models in large networks. The algorithm can be used as an optimized Markov chain Monte Carlo (MCMC) method, with a fast mixing time and a much reduced susceptibility to getting trapped in metastable states, or as a greedy agglomerative heuristic, with an almost linear [Math Processing Error] complexity, where [Math Processing Error] is the number of nodes in the network, independent on the number of blocks being inferred. We show that the heuristic is capable of delivering results which are indistinguishable from the more exact and numerically expensive MCMC method in many artificial and empirical networks, despite being much faster. The method is entirely unbiased towards any specific mixing pattern, and in particular it does not favor assortative community structures.

Cite as:

[arXiv:1310.4378](https://arxiv.org/abs/1310.4378) [physics.data-an]

(or [arXiv:1310.4378v2](https://arxiv.org/abs/1310.4378v2) [physics.data-an] for this version)

Skyrme functional from a three-body pseudo-potential of second-order in gradients.

Formalism for central terms

J. Sadoudi, T. Duguet, J. Meyer, M. Bender

Description: In one way or the other, all modern parametrizations of the nuclear energy density functional (EDF) do not respect the exchange symmetry associated with Pauli's principle. It has been recently shown that this practice jeopardizes multi-reference (MR) EDF calculations by contaminating the energy with spurious self-interactions that, for example, lead to finite steps or even divergences when plotting it as a function of collective coordinates. As of today, the only viable option to bypass these pathologies is to rely on EDF kernels that enforce Pauli's principle from the outset by strictly and exactly deriving from a genuine, i.e. density-independent, Hamilton operator.

We wish to develop the most general Skyrme-like EDF parametrization containing linear, bilinear and trilinear terms in the density matrices with up to two gradients, under the key constraint that it derives strictly from an effective Hamilton operator. The most general three-body Skyrme-like pseudo-potential containing up to two gradient operators is constructed to generate the trilinear part. The present study is limited to central terms. Spin-orbit and tensor will be addressed in a forthcoming paper.

Cite as:

[arXiv:1310.0854](https://arxiv.org/abs/1310.0854) [nucl-th]

(or [arXiv:1310.0854v1](https://arxiv.org/abs/1310.0854v1) [nucl-th] for this version)

Calculations of three-nucleon reactions with N3LO chiral forces: achievements and challenges

Henryk Witala, Jacek Golak, Roman Skibinski, Kacper Topolnicki

Description:

We discuss the application of the chiral N3LO forces to three-nucleon reactions and point to the challenges which will have to be addressed. Present approaches to solve three-nucleon Faddeev equations are based on a partial-wave decomposition. A rapid increase of the number of terms contributing to the chiral three-nucleon force when increasing the order of the chiral expansion from N2LO to N3LO forced us to develop a fast and effective method of automatized partial wave decomposition. At low energies of the incoming nucleon below about 20MeV, where only a limited number of partial waves is required, this method allowed us to perform calculations of reactions in the three-nucleon continuum using N3LO two- and three-nucleon forces. It turns out that inclusion of consistent chiral interactions, with relativistic $1/m$ corrections and short-range 2π -contact term

omitted in the N3LO three-nucleon force, does not explain the long standing low energy A_y -puzzle. We discuss problems arising when chiral forces are applied at higher energies, where large three-nucleon force effects are expected. It seems plausible that at higher energies, due to a rapid increase of a number of partial waves required to reach convergent results, a three-dimensional formulation of the Faddeev equations which avoids partial-wave decomposition is desirable.

Cite as:

[arXiv:1310.0198](https://arxiv.org/abs/1310.0198) [nucl-th]

(or [arXiv:1310.0198v1](https://arxiv.org/abs/1310.0198v1) [nucl-th] for this version)

Propagation of stationary exothermic transition front with nonstationary oscillatory tail

V.V. Smirnov, O.V.Gendelman, L.I. Manevitch

Description:

We consider a propagation of exothermic transition front in a discrete conservative oscillatory chain. Adequate description of such fronts is a key point in prediction of important transient phenomena, including phase transitions and topochemical reactions. Due to constant energy supply, the transition front can propagate with high velocities, precluding any continuum-based considerations. Stationary propagation of the front is accompanied by formation of a non-stationary oscillatory tail with complicated internal structure. We demonstrate that the structure of the oscillatory tail is related to a relationship between phase and group velocities of the oscillations. We suggest also an approximate analytic procedure, which allows one to determine all basic characteristics of the propagation process: velocity and width of the front, frequency and amplitude of the after-front oscillations, as well as the structure of the oscillatory tail. As an example, we consider a simple case of biharmonic double-well on-site potential. Numeric results nicely conform to the analytic predictions.

Cite as:

[arXiv:1310.0637](https://arxiv.org/abs/1310.0637) [nlin.PS]

(or [arXiv:1310.0637v1](https://arxiv.org/abs/1310.0637v1) [nlin.PS] for this version)

Integrable multi-component Camassa-Holm system

Baoqiang Xia, Zhijun Qiao

Description:

In this paper, we propose a multi-component system of Camassa-Holm equation, denoted by $CH(N, H)$ with $2N$ components and an arbitrary smooth function H . This system is proven integrable in the sense of Lax pair and infinitely many conservation laws. We particularly study the case of $N=2$ and derive the peaked soliton (peakon) solutions.

Cite as:

[arXiv:1310.0268](https://arxiv.org/abs/1310.0268) [nlin.SI]

(or [arXiv:1310.0268v1](https://arxiv.org/abs/1310.0268v1) [nlin.SI] for this version)

On the Instability of Global de Sitter Space to Particle Creation

Paul R. Anderson, Emil Mottola

Description:

We show that global de Sitter space is unstable to particle creation, even for a massive free field theory with no self-interactions. The $O(4,1)$ de Sitter invariant state is a definite phase coherent superposition of particle and anti-particle solutions in both the asymptotic past and future, and therefore is not a true vacuum state. In the closely related case of particle creation by a constant, uniform electric field, a time symmetric state analogous to the de Sitter invariant one is constructed, which is also not a stable vacuum state. We provide the general framework necessary to describe the particle creation process, the mean particle number, and dynamical quantities such as the energy-momentum tensor and current of the created particles in both the de Sitter and electric field backgrounds in real time, establishing the connection to kinetic theory. We compute the energy-momentum tensor for adiabatic vacuum states in de Sitter space initialized at early times in global S^3 sections, and show that particle creation in the contracting phase results in exponentially large energy densities at later times, necessitating an inclusion of their backreaction effects, and leading to large deviation of the spacetime from global de Sitter space before the expanding phase can begin.

Cite as:

[arXiv:1310.0030](https://arxiv.org/abs/1310.0030) [gr-qc]

(or [arXiv:1310.0030v1](https://arxiv.org/abs/1310.0030v1) [gr-qc] for this version)

Standard

Stationary solutions and asymptotic flatness II

Martin Reiris

Description:

This is the second part of the investigation started in [Stationary solutions and asymptotic flatness I]. We prove here that Strongly Stationary ends having cubic volume growth are Weakly Asymptotically Flat. Combined with the results of the previous paper this shows that Strongly Stationary ends are Asymptotically Flat with Schwarzschildian fall off.

Cite as:

[arXiv:1310.0339](https://arxiv.org/abs/1310.0339) [gr-qc]

(or [arXiv:1310.0339v1](https://arxiv.org/abs/1310.0339v1) [gr-qc] for this version)

Science Vitality Platform



Vitayard is a research sharing platform of the ‘scavenging’ type. It is powered by selections and submissions to the [Vitayard Blog](#). Vitayard is supported by the [Open Knowledge Foundation Network, India](#). Visit our website : <http://vitayard.in> and participate in the discussion.

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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 today’s 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/>

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We accept submissions made online only. Visit the Vitayard Website at: www.vitayard.in or the Vitayard Blog Force at: <http://vitayard.wordpress.com> for details.

From our First Issue:

Imminent Changes In The Publication Process In Sciences.

‘In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual.’ – Galileo Galilei

The present system of dissemination of research is primarily based upon publication in ‘peer reviewed’ journals. While the journals themselves stand to gain profit from the research done by scientists, the hapless researcher can think of only one gain, i.e., being published in a ‘peer reviewed’ ‘prestigious journal’. In today’s world, many such ‘prestigious’ journals even demand money from the researchers for publishing their work. The much debated ‘peer review’ that such journals ensure primarily include the opinions only a few ‘know-it-alls’. While much trash pass through this ‘very efficient’ system, many great works are ridiculed. Journals lose so much of their funds maintaining such a process.

However, the journals did once serve their purpose. The journal-system once used to be one of the best forms of dissemination of research, before it hit the stone-wall of scientific elitism driven almost entirely by profit-making forces. This system of publication is obsolete (to put it very mildly) and its replacement by more efficient systems is long overdue. In today’s information-driven world there can be no place for any false sense of intellectual aristocracy. Advent of the Internet and cloud-based storage, which allows peers to look easily into each other’s work, has made the logic behind continuing with the medieval system of ‘peer review’ even more ineffectual.

Discussing with an open mind, what purpose do the journals serve now except serving commercial interests of a select few? A free storage service like the [arXiv](#) should be enough for disseminating research. While this particular storage has turned elitist over time, new ones like [figshare](#) have many added features to make the work of the scientific community easier. Figshare makes good use of cloud based storage and it allows all forms of research to be published. A peer review by the whole scientific community is always better than that done by a chosen few. The journals can still survive ‘scavenging’ for their favoured research works that are already published in [Open Science](#) data-repositories. They can choose works from such repositories and re-publish them if they wish to, giving due credit. However, dissemination of research in a place like [figshare](#) should be enough for the researcher in terms of publication and credit. A progressive involvement of the community of scientists, as a whole, is required for providing these new systems the much needed impetus.”

What this platform aims at is becoming a proper and successful ‘Scavenging’ platform, publishing chosen research content. Researchers can contact us directly too with their content for our approval.

The Plans We Have As Proud Members of OKFN India

Here is a list of things that Open Knowledge Foundation, India, would like to pay more attention to in the coming days:

1. ***Push for Open Science and Research practices in Indian research institutions.*** OKFN has been promoting Open Science and Open Research all over the world for quite some time now. In India, we have a lot of work to do in this respect. We have to involve more and more research bodies in the spirit of Open Science in order to see any considerable progress. Also, encouraging individual researchers to practice Open Science too can go a long way in bringing about a change.
2. ***More involvement of citizens in the spirit of Open Knowledge.*** OKFN is fuelled by the thousands of citizen activists all over the world, who devote their time and energy to the common dream of a better informed world. 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.
3. ***Push for education.*** We would have to work as much as we can in ensuring at least basic education for those children, who are not likely to see the light of education due to various reasons. This is a monumental task, taking into account the gigantic size of the population of India. However, every little helps. Involving the masses can to a great extent result in a quicker transformation of the present scene (for example, we can have citizens making study material open and free and also involve them more in the dispersion of education). We aim to arrange for vocational profession-based education for the adult population. This way, we can work towards uplifting the economy from the grassroots.

Feel free to contact us with your suggestions. Also, tell us how **You** can help the cause. **Subhajit Ganguly, Ambassador, Open Knowledge Foundation Network, India. Contact: gangulysubhajit63@gmail.com. Mailing Address: 78/4, Salimpur Road, Dhakuria, Kolkata 700031 (India).** - See more at: <http://in.okfn.org/#sthash.POyqkMqW.dpuf>

Featured Article:

Press Release : Government data still not open enough—new survey on eve of London summit

Open Data Index provides first major assessment of state of open government data

In the week of a major international summit on government transparency in London, the Open Knowledge Foundation has published its 2013 Open Data Index, showing that governments are still not providing enough information in an accessible form to their citizens and businesses.

The UK and US top the 2013 Index, which is a result of community-based surveys in 70 countries. They are followed by Denmark, Norway and the Netherlands. Of the countries assessed, Cyprus, St Kitts & Nevis, the British Virgin Islands, Kenya and Burkina Faso ranked lowest. There are many countries where the governments are less open but that were not assessed because of lack of openness or a sufficiently engaged civil society. This includes 30 countries who are members of the Open Government Partnership.

The Index ranks countries based on the availability and accessibility of information in ten key areas, including government spending, election results, transport timetables, and pollution levels, and reveals that whilst some good progress is being made, much remains to be done.

Rufus Pollock, Founder and CEO of the Open Knowledge Foundation said:

Opening up government data drives democracy, accountability and innovation. It enables citizens to know and exercise their rights, and it brings benefits across society: from transport, to education and health. There has been a welcome increase in support for open data from governments in the last few years, but this Index reveals that too much valuable information is still unavailable.

The UK and US are leaders on open government data but even they have room for improvement: the US for example does not provide a single consolidated and open register of corporations, while the UK Electoral Commission lets down the UK's good overall performance by not allowing open reuse of UK election data.

There is a very disappointing degree of openness of company registers across the board: only 5 out of the 20 leading countries have even basic information available via a truly open licence, and only 10 allow any form of bulk download. This information is critical for range of reasons – including tackling tax evasion and other forms of financial crime and corruption.

Less than half of the key datasets in the top 20 countries are available to re-use as open data, showing that even the leading countries do not fully understand the importance of citizens and businesses being able to legally and technically use, reuse and redistribute data. This enables them to build and share commercial and non-commercial services.

Pollock:

For the true benefits of open data to be realised, governments must do more than simply put a few spreadsheets online. The information should be easily found and understood, and should be able to be freely used, reused and shared by anyone, anywhere, for any purpose.