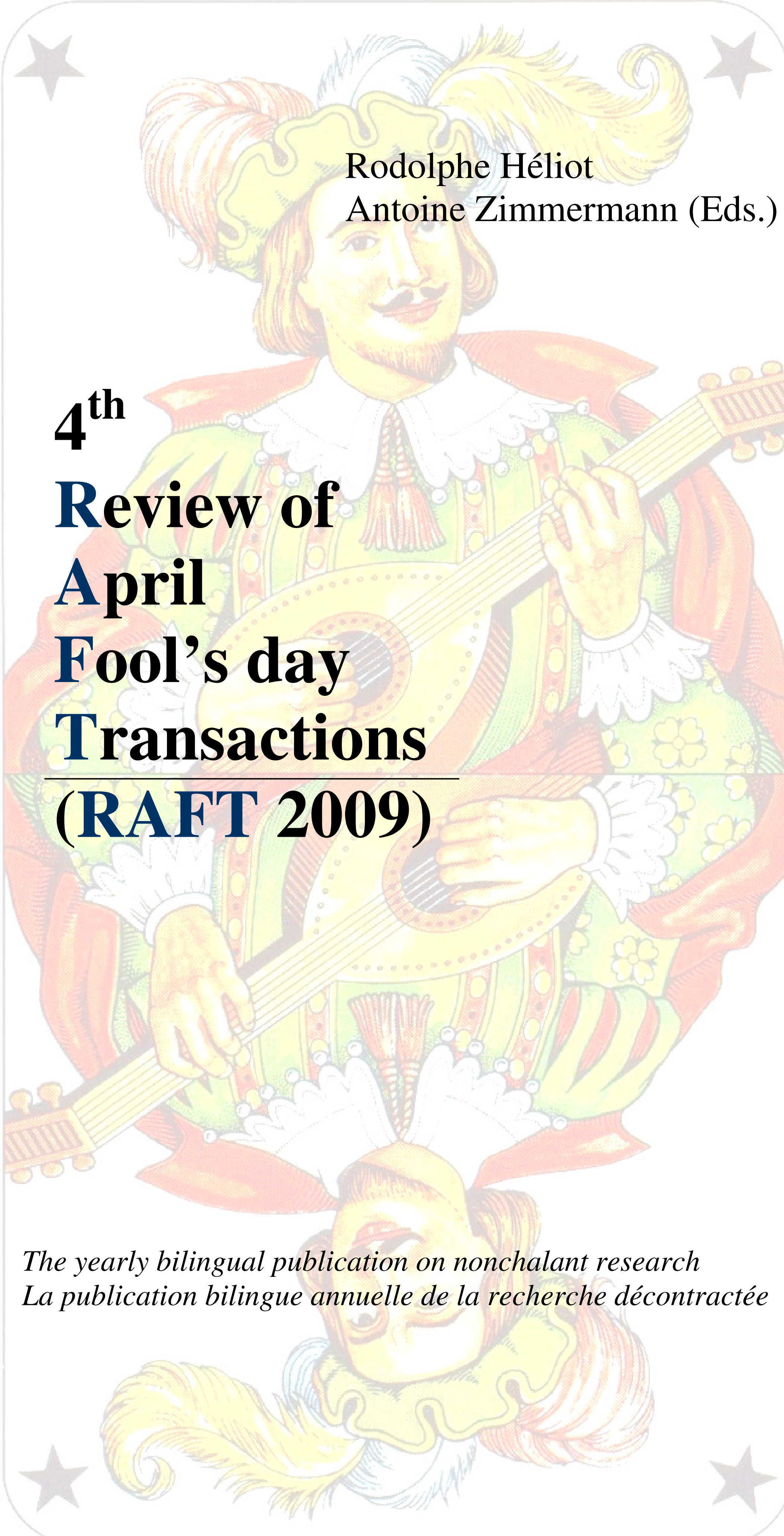

Rodolphe Héliot
Antoine Zimmermann (Eds.)

4th Review of April Fool's day Transactions (RAFT 2009)

The yearly bilingual publication on nonchalant research
La publication bilingue annuelle de la recherche décontractée

Preface

Once again, for its fourth edition, the Review of April Fool's day Transactions demonstrates that it can offer to inventive scientists a framework where thay can express their uncommon visions with all their desired liberty of topic and format. Again, our variety of fields has broaden. Indeed, while last year's issue addressed the very trendy paleoproccessology, today it presents such subjects as zoo-cute-ology, cosmology, lepidopterology and statisticologicalistic-driven decision making. This time, we would like to stress the outstanding results presented in our featured article. Again, we thank our helpful sponsors for their non-support. To wrap things up, we are proud to introduce this latest issue of RAFT, and definitely egg you on to read us, as well as to write us.

Une fois de plus pour sa quatrième édition, la Revue des Actes du Premier Avril démontre qu'elle peut offrir à des scientifiques inventifs un cadre dans lequel ils peuvent exprimer leurs visions hors du commun, en toute liberté, sur les thèmes et selon le format qu'ils désirent. À nouveaum la variété des sujets s'est élargie. En effet, alors que la précédente édition abordait la paléprocessologie très en vogue, aujourd'hui nous présentons des sujets comme la zoo-trognonologie, la cosmologie, la lépidopérologie et l'aide à la décision statisticolocastique. Cette fois-ci, nous aimerions insister sur les résultats remarquables décrits dans l'article vedette de cette année. Nous remercions encore nos généreux sponsors pour leur vain soutient. Pour résumer, nous sommes fiers de vous présenter ce dernier numéro du RAFT, et nous vous invitons franchement à nous lire et à nous écrire.

1st April 2009

Rodolphe Héliot & Antoine Zimmermann
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Table of Contents

Hall of Fame:
The Scientist Fool

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The Scientist Foul

On the current issue, we will highlight this amazing metaphorical character: the Scientist Fool (see Fig. 1 and Fig. 2).

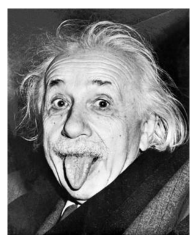

Fig. 1.

The Scientist Fool is funny, old and never publishes [1]. However, he had a huge impact on the study of the human tongue and its mucosa.

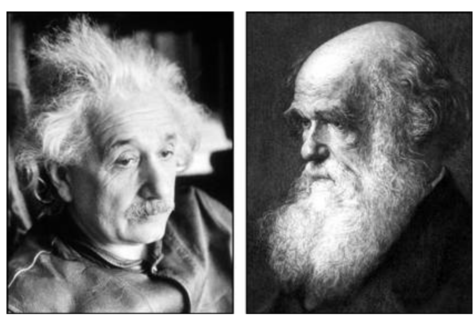

Fig. 2. The Scientist Fool can take many forms.

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What is the surface tension of this kitty?

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Abstract

Cats are often observed in puddle form as they lie on the floor. Key parameters relating to this feline fluid can be extracted from the resulting geometry. Fitting an empirical curve around the volume of a kitty-puddle allows us to calculate its surface tension. This combined with the contact angle of the puddle with respect to the floor gives us the energy of adhesion of the cat-floor interface. Analysis of a representative sample kitten on a rather ailurophobic hardwood floor with contact angle of 130^o indicates a surface tension of $30N/m$. This calculated value is over an order of magnitude greater than any conventional fluid.

Keywords: Feline fluids, Kitty-puddle, Surface tension, Adhesion energy, Empirical model.

1 Introduction

Puddles are formed when a liquid comes in contact with solid surface in a gaseous medium. Counteracting forces define the geometry of this sessile drop, both at the liquid-gas interface and the liquid-solid-gas triple point. The cohesive force between liquid molecules draws the drop together while body forces such as gravity pull the molecules towards the solid-liquid interface. Adhesion between the liquid and the solid spreads the drop out.

Known parameters can be applied to generate the resultant puddle shape. Conversely, an empirical match of a puddle's geometry to one of a family of such shapes can be used to infer the fluid parameters. This study seeks a numerical approximation to feline surface tension σ and adhesion energy per unit area to a wooden floor ΔW in air. The representative kitty-puddle to be analyzed is shown in figure 1 [4].

2 Background

2.1 Bond Number

The Bond number Bo is a dimensionless ratio of body (gravitational) effects to cohesive (surface tension) forces of a liquid in a gaseous medium. The gravitational forces are parameterized by the densities of the fluids ρ along with a

Fig. 1. What is the surface tension of this kitty?

characteristic physical dimension r_0, the radius of curvature at the top of the liquid drop. The cohesive force is represented by the surface tension of the fluid-gas interface σ [12].

$$Bo = \frac{g r_0^2 \left(\rho_{liq} - \rho_{gas}\right)}{\sigma}. \quad (1)$$

A Bond number of zero, indicating no body forces at all, results in a perfectly spherical liquid-gas interface. Higher Bond numbers indicate greater influence of gravity (or lower surface tension), causing flattening of the bubble. The specific shape of the drop can be numerically determined and tabulated for a range of Bond numbers [10]. A comparison of puddles with $Bo = 1, 5$ is shown in figure 2.

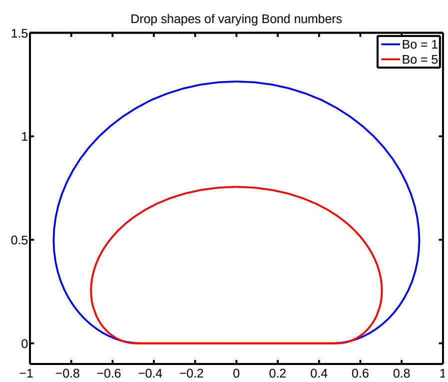

Fig. 2. Two puddles with different Bond numbers demonstrate the different drop shapes resulting from varying body forces or surface tension. These nondimensionalized shapes can be scaled up or down to fit an empirical drop.

A physical drop can be matched against the family of shapes to determine the best fit, and thereby infer the Bond number for that liquid-gas interface.

This match can be effectively determined by a computer program [11], or more simply by inspection.

2.2 Contact Angle

The puddle shape defined by the Bond number is independent of the adhesive forces between the solid and the liquid, and in fact describes a drop in which the two phases do not interact. The boundary of the liquid then lies tangent to the solid surface. Any adhesion between the two will cause the liquid-solid interface to have non-zero extent. This results in the tangent to the liquid-air interface intersecting the solid surface. The angle between the two through the liquid volume is defined to be the contact angle θ_C. This is shown in figure 3.

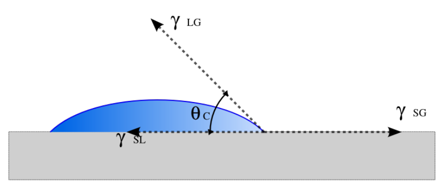

Fig. 3. The contact angle θ_C of a liquid drop on a solid surface is a function of the adhesive forces between the two phases. Image from [3].

The drop geometry described by the Bond number is truncated by the plane of the solid to give the final shape of the puddle; the resulting contact angle of the solid-liquid interface is defined by the adhesion energy ΔW of the liquid per unit area to the solid in the gaseous medium. They are related by the Young-Dupre equation [3]:

$$\sigma(1 + \cos(\theta_C)) = \Delta W. \tag{2}$$

Horizontal surfaces intersecting a drop at varying contact angles and the resulting puddle shapes are shown in figure 4.

3 Kitty-puddle Fitting

The profile of the puddle shown in 1 can now be analyzed to characterize the feline fluid. The contact angle is measured to average 130^o between the advancing and receding edges of the drop. Fitting a drop shape cut off at $\theta_{C_{kitty}} = 130^o$ around the cat, the Bond number can be approximated by $Bo_{kitty} = 1$. The resulting theoretical puddle is overlaid on the empirical photograph in figure 5.

The kitten doesn't fit completely inside the predicted shape; the posterior of the animal protrudes beyond the expected boundary. This is a manifestation of the non-ideality of the surface on which the kitty-puddle rests. Due to the macro- and microscopic irregularities in surface texture, there are a range of stable

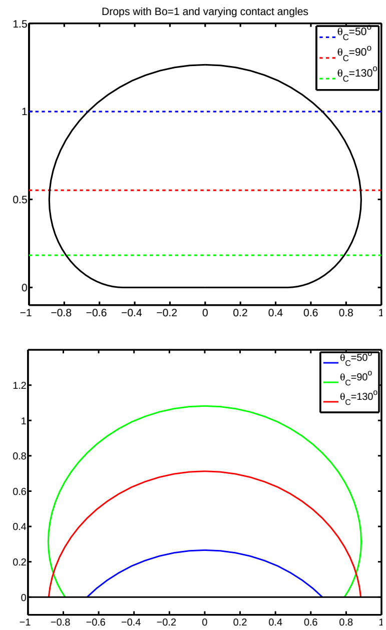

Fig. 4. Varying surface adhesion energy causes the base of a drop to spread out along a surface. For a given bond number, this has the effect of truncating the base of the drop shape at a given contact angle.

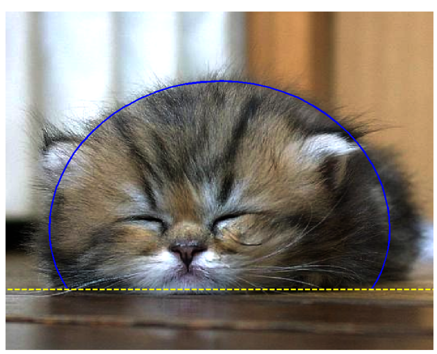

Fig. 5. Cat in a bubble!

interfacial states, and a dynamic analysis of the formation of the drop would be necessary to account for the deviation from the ideal drop shape [9]. However, because the bulk of the fluid fits the predicted curve quite well, we can ignore the slight perturbation in our consideration of bulk kitten fluid parameters.

3.1 Physical kitten parameters

According to [2], the average weight of a Moggy cross breed small cat is $3.4kg$. Modeling the cat as a cylinder of radius $6cm$ and length $35cm$ yields a density

$$\rho_{kitty} = \frac{3.4kg}{\pi(.06m)^2(.35m)} = 859kg/m^3.$$

3.2 Surface tension of a kitten

Equation (1) for the Bond number can be inverted to calculate the surface tension of the kitten:

$$\sigma_{kitty} = \frac{gr_0^2(\rho_{kitty} - \rho_{air})}{Bo}. \tag{3}$$

Fitting in parameters described above gives

$$\begin{aligned}\sigma_{kitty} &= \frac{9.81\frac{m}{s^2}(0.06m)^2(859\frac{kg}{m^3} - 1.2\frac{kg}{m^3})}{1} \\ &= 30N/m.\end{aligned}$$

3.3 Adhesion energy of a kitten on a hardwood floor

The Young-Dupre equation (2) can now be used to calculate the adhesion energy per unit area of the cat to a hardwood floor in an air medium. Given the observed contact angle and calculated surface tension,

$$\begin{aligned}\Delta W &= \sigma_{kitty}(1 + \cos(\theta_{C_{kitty}}) \\ &= 10.7J/m^2.\end{aligned}$$

The estimated (from literature), measured (from the image), and calculated parameters for the representative feline sample are summarized in table 1.

4 Conclusion

This work features the first foray into the field of fauna fluids, focusing on felines.

The calculated surface tension of the kitten is over two orders of magnitude greater than that of water at room temperature $\sigma = 0.0728N/m$, and still notably higher than mercury $\sigma = .4254N/m$ [8]. This indicates great promise for the use of kittens as a new class of heat transfer fluid.

The high contact angle of the kitten on a hardwood floor is indicative of a strongly ailurophobic surface. In fact, the rather low interfacial adhesion energy is less than the energy required to lift the cat just $2cm$. This explains the ease at which napping kitty-puddles can be picked off of the floor.

Table 1. Feline fluid parameter values

Parameter	Description	Type	Value Units
r_0	Radius of a kitten	E	6 cm
g	Acceleration (gravity)	E	9.81 m/s^2
ρ_{kitty}	Density of a kitten	C	859 kg/m^3
ρ_{air}	Density of air	E	1.2 kg/m^3
Bo_{kitty}	Bond number	M	1
σ_{kitty}	Surface tension	C	30 N/m
$\theta_{C_{kitty}}$	Contact angle	M	130^o
ΔW	Adhesion Energy	C	10.7 J/m^2

Fig. 6. Further examples of fluid puddles from throughout the animal kingdom. Top row: bunny [5], hedgehog [6]. Bottom row: penguin [1], human [7].

Kittens aren't the only animals that form drops on solid surfaces. It would be interesting to conduct further research into establishing fluid properties for other animals to compare with kittens and other conventional liquids. Some examples of animal puddles are shown in figure 6.

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Bullet with butterfly wings [1]

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Abstract

Les papillons sont nos amis et apparaissent un peu partout sans prévenir.
Mots clefs: Lépidoptères, Armes à feu.

1 Introduction

Fig. 1. *Lepidoptera.*

Les lépidoptères (*Lepidoptera*), plus communément appelé papillons, sont un ordre d'insectes regroupant 127 familles et environ 165000 espèces répertoriées qui malgré une grande variété de formes et de couleurs, présentent une même structure (Fig. 1). Leur corps, protégé par une carapace articulée, comporte une tête, un thorax et un abdomen et 6 pattes comme tous les insectes. Mais en plus de ces caractéristiques communes aux insectes, il en est une qui est éminemment distinctive des papillons: les ailes. Ces deux paires d'ailes sont constituées d'écailles colorées qui sont des soies aplaties. D'ailleurs le mot "lépidoptères" vient de cette caractéristique: *lepidos* signifie écailles en grec [2].

Bien que la plupart des espèces de papillons soient d'ores et déjà répertoriées notre équipe à mis en évidence, grâce à des procédés d'observation de pointe, l'existence d'un nouveau papillon, nommé *Lepidoptera hominis*. Malheureusement, nous ne disposons actuellement que de traces de son existence mais nous espérons le capturer bientôt.

2 Matériel et méthode

Neuf jeunes adultes ont été recrutés pour cette étude dans les étudiants et la communauté locale. Leur âge, taille et poids étaient de 23 à 42 ans (27 ± 6 ans), 168 à 191 cm (179 ± 7 cm) et 65 à 81 kg (70 ± 6 kg), respectivement. Les individus ont tous donnés leur consentement écrit, la procédure respecte les règles des comités d'éthique locaux et en accord avec les règles d'éthique de la déclaration d'Helsinki.

3 Système d'acquisition

Les mouvements ont été acquis grâce à un système optoélectronique Elite (BTS, Milan), les forces grâce à des plateformes de force (AMTI, USA).

4 Résultats

4.1 Dynamique

Sur les plateformes de force, on voit clairement apparaitre au fil du temps deux signaux distincts qui forment chacun une aile du papillon (Fig. 4.1). On remarque bien la symétrie droite/gauche dans la forme et le bout inférieur pointu de chaque aile tandis que le bout supérieur est presque droit sur un coté, caractéristique commune à beaucoup d'espèces de papillons.

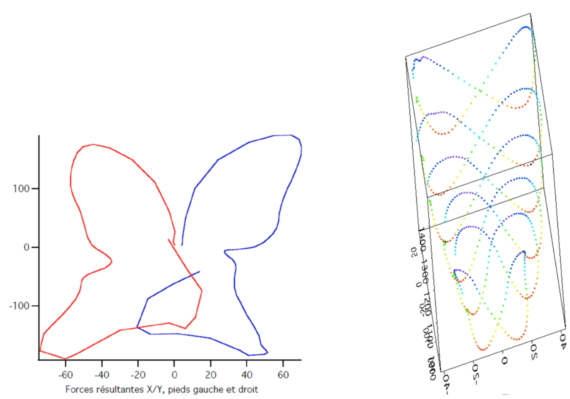

Fig. 2. Résultats: dynamique (gauche) et cinématique (droite).

4.2 Cinématique

Le système de capture en 3D du mouvement nous a en outre permis d'observer le mouvement et le comportement semble social de cette nouvelle espèce (Fig. 4.1). Ainsi, ils se déplacent souvent en groupe, en adoptant une formation tout à fait particulière.

5 Discussion

Le passage des nos neufs sujets nous a ainsi permis d'observer de façon extrêmement reproductible la présence de *Lepidoptera hominis*. D'une part la force résultante sous chacun de leur pied, projetée sur le sol, formait chacun une aile dont la position était analogue à celle d'un papillon. Mais en outre, la trajectoire de leurs vertèbres par rapport à leur pieds froment aussi une tribu de papillons en vol (Fig. 3).

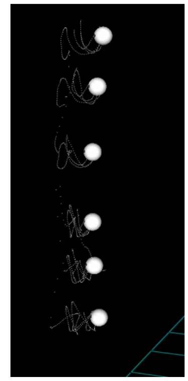

Fig. 3.

6 Conclusion

Il se trouve dans la nature des phénomènes qui font les chercheurs se sentir des artistes.[1]

"Seuls l'art et la science élèvent l'homme jusqu'à la divinité."[2]

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[2] L. V. Beethoven.

Further Dark Matter/Energy Epicycles

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Abstract

Dark matter and dark energy epicycles are not sufficient for explaining the cosmos. We add another epicycle to the midst.
Keywords: Cosmology, Darkness, Epicycles.

1 Introduction

As new measurements of motions of interstellar bodies and the background blackbody radiation continue to be made, additional epicycles of Dark Matter and Dark Energy need to be hypothesized to maintain the cosmological structure built up in previous centuries. Just as it was necessary to hypothesize the circles moving within circles moving within circles in order to maintain the established theory that planets orbited the Earth and that motions in circles were the natural kinds of motion [6], new twists are needed in addition to the undetectable ("dark") energy pushing galaxies apart, undetectable ("dark") matter providing enough mass for galaxies to stay together, and a magical "inflation" period during the Big Bang that spread matter and space out at far faster than the speed of light.

2 Current Theories

The firm quicksand upon which the details of cosmology are built are measurements of red shifts in spectra of galaxies, observed brightness of Type 1a supernovae in distant galaxies, infrared blackbody radiation from inter-galactic space, differential red-shifts in different parts of the same galaxy, and brightness and visual angle measurements of galaxies. We assume that the carefully and precisely measured values of the speed of light in a vacuum and the gravitational constant have remained absolutely constant throughout all of space time, and that Einstein's theories of special [1] and general [2] relativity hold throughout all space and time using these unchanging constants. We accept that matter curves space as defined by general relativity and that a very gentle space curvature could make the universe a closed, not an open, system, but will not consider uneven space curvature unrelated to mass to be a possible initial condition at the time and location of the Big Bang.

The basic description of cosmology is quite simple before the epicycles made necessary due to pesky observations are added to the system. About 13.7 billion years ago, all matter in the universe was extremely densely packed in one place. This region exploded spreading material evenly in all directions. Random fluctuations in the material as it spread out gave some regions slightly higher density than other regions. Gravitational attraction drew more material to the denser regions and away from the regions of less density. The regions of greater density ended up becoming (at various scales) galaxies, super galaxies, stellar clusters, and eventually stars. Many early stars were extremely massive due to the high concentration of hydrogen in the regions where they formed, so they rapidly generated isotopes of higher mass and through supernovae spread them into the still expanding gas. Later star formation from gas clouds comprised of more than hydrogen and helium allowed planet formation as well.

The question naturally arose as to the size and density of the object that exploded in the Big Bang to create the "universe as we know it". By extrapolating the boundary of an explosion back in time, one not only reaches the original volume and density of the object that exploded, but reaches smaller and denser starting conditions, if carried too far. For an explosion deemed absolutely spherical, one reaches infinite density at a single point as a limit to the extrapolation.

So what was the original size? Extrapolating back in time, as the universe gets smaller, denser, and hotter, a point is reached where the density and heat are too extreme for atoms, and therefore all the matter is in a plasma form. Such plasma consistently absorbs and re-emits photons, so that only when the Universe has cooled below that point (at around 3000 Kelvin) does it become transparent. This point in the expansion of the Universe after the big bang should result in a detectible blackbody radiation of 3,000 K, which due to red shift we currently observe as 2.75 K microwaves. The variation detected in the blackbody radiation in all directions is anisotropic to only one part in 100000—which is what one would expect from natural thermal variation in a body of constant temperature.

Astronomical instruments cannot see further back than that, since at higher densities the radiation is constantly being absorbed and re-emitted. This means that any theory that can account for the conditions when the Universe became transparent is fair game—and the fun begins.

These conditions are easy to summarize—an isotropic expanding universe at 3000 K whose detectible matter was 75% hydrogen and 25% helium and no weird particles[1]. The apparent size of the universe is larger (in light years) than the maximum age in years calculated assuming a constant expansion rate before this time.

Several early theories for explaining how the universe may have started expanding from a large dense hot mass (oscillating universe [7], Phoenix universe [3], and Mixmaster universe [5]) due to earlier events have had problems, so a Big Bang has become gospel. Each time problems appear in the Big Bang theory, an epicycle has to be postulated to explain it away.

[1] ignoring the fact that if they existed they wouldn't be weird

A major problem with the theories that had the Universe exist in some form prior to the start of expansion was their difficulty in explaining the smoothness of space. Unfortunately, that was equally a problem for the Big Bang, but as that was the only theory left, it had to be explained away. This first epicycle was called "inflation", meaning a period in which the universe magically increased in size by a factor of 10^{26} (coincidentally the same factor it has increased since then) far faster than light from 10^{-36} seconds to 10^{-32} seconds after the start of the Big Bang. After this epicycle, the universe was marvelously flat and far larger than 10^{-32} light seconds in size. Any magnetic monopoles that could have been created between 10^{-43} seconds and 10^{-36} seconds would have been scattered far enough apart that we could never detect any.[2]

The next problem arises as we extend the theory of gravity that works so well at the scale of the solar system and smaller objects to galaxies and larger structures. The equations do not match the observed motions given the observed sum of stellar masses. The first attempt to solve this was to hypothesize that there was more matter in clouds of cool interstellar gas such as blocks our view of the center of our galaxy.

However, trying to determine rules for placement, density, and distribution of such gas to create such effects in hundreds of thousands of observed galaxies proved impossible. Hypothesizing massive black holes in the center of galaxies allowed for more mass in galaxies—and evidence of them has recently been pouring in—but they don't explain the distribution of orbital velocities of stars at different distances from the center.

Another epicycle was necessary. The general theory of relativity describes a relationship between gravity and the curvature of space. Galaxies acting as gravitational lenses are predicted, and have been observed. However, the features of the gravitational lenses did not match predictions. One possible solution to the conundrum was to suggest some modification of the law of gravity, such as a slight variation of the gravitational constant due to variations in mass density averaged over hundreds of thousands of light years or finding other terms that come into the equations on such scales. But this law, which keeps causing problems at scales many orders of magnitude greater than those for which it had been devised, can not be touched, and neither can its constant, so a new kind of non-baryonic mass: "dark" matter was hypothesized. Neutrinos can be classified as dark matter, but their mass is too small and they won't stay confined, so other non-detectible dark matter must exist. In fact, to explain the gravitational lensing abnormalities, there must be more than five times as much undetectable dark matter as baryonic matter.

The rate of expansion of the universe is measured by comparing the observed brightness of Type 1a supernovae with their red shifts. These supernovae occur as white dwarfs accrete matter and finally reach densities at which their carbon centers fuse causing a chain reaction resulting in a supernova. Given a set of assumptions:

[2] Please ignore the ridiculosity of anything happening over the whole universe in such short periods of time.

- Over the lifetime of the universe the accretion rates of white dwarfs have always been small;
- White dwarfs formed in the early Universe (in which there were no heavy isotopes) explode identically as more recently created ones (which have small amounts of trans-iron isotopes);
- Red shifts are due solely to motion away from the Earth mostly due to expansion of the Universe instead of actual motion (as opposed to changes over time in the curvature of space or in physical constants);

graphs of the distance (from brightness) to speed (from red-shift) can be created.

A third surprise occurred when such graphs were drawn, indicating a slight curvature in the distance/speed curve. Instead of investigating the possibility of variations in Type 1a white dwarfs over time or variations in the curvature of space, this curve is taken to mean that the Universe had started slowing its expansion, but is now speeding up again. However, this epicycle does not rely on a magical expansion, as in "inflation", but in a magical energy which is not part of the calculation when ALL (other) forms of energy are unified within 10^{-43} seconds of the start of the Big Bang. This energy has a mass equivalent (to be kind to Einstein) but does not affect matter—only space. It turns out that this explanation needs 74% of the mass/energy of the universe to be tied up in such "dark" energy given our current theory of gravity.

Even with these dark epicycles, there is a significant problem. Considering the density of dark matter, even though it is invisible, its gravitational effects would cause the actual motions of Neptune, Pluto, Kuiper Belt objects, and the Oort cloud to be different than observed. This suggests that dark matter is not evenly distributed, but clustered in massive invisible objects. The requirement that no such object be near enough to disrupt our stellar system increases the smallest possible size of such objects to such an extent, that they would gravitationally affect nearby stars. However, this effect is not seen, either. Time for another epicycle.

3 The New Epicycle

We put forth the final epicycle in this paper—"dark ether". The dark ether is naturally undetectable, just as dark energy and dark matter are, and the 19th Century ether was. Just as the 19th Century ether (which Michaelson and Morley destroyed [4]) was the medium that transmitted light, the dark ether transmits gravity—but not all gravity, just dark gravity (gravity emitted by dark matter). Dark matter attaches to dark ether and its gravity is darkly expanded at the quantization scale of dark ether and then evenly relayed into baryonic space. Since, as shown in Fig. 1, dark ether is quantized on the order of 3200 parsecs, this even distribution allows for the observed gravitational effects of dark matter at large scales, but not at small ones.

Fig. 1. Dark Ether Quantization

4 Future Work

We will continue to posit epicycles whenever we find a problem with our theories.

5 Acknowledgement

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SISO-SIG: a predictive model for scientific event interest

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Abstract

To avoid losing time and money, it is extremely useful to be able to know in advance the interest of the next scientific event to come. We propose in this paper a SISO-SIG model that aims at predicting the interest of future scientific events. Results show excellent correlation (R=0.99) between predicted and actual event interest.
keywords: Scientific conferences, Auto-Regressive models, Oysters.

1 Introduction

A scientist, at various points of his career quite often face the same question: "should I stay or should I go?" More precisely, "should I attend or not this particular conference/workshop/_______[1] ?" Indeed, this question is an extremely important one, since the slightest mistake in the event choice can lead to dramatic consequences such as feeling dumb, or guilty, or worst of all, to extreme boredom. Thus, it would extremely useful for the scientific community to have access to a tool enabling to predict the interest of the next event to come. This is precisely the goal of this paper[2]. We propose here a model called SISO-SIG, for Should I Stay Or Should I Go. Paper is organized as follows: section 2 reviews the methods used to establish such a model, section 3 presents the results, that are followed by a discussion.

2 Methods

To build an accurate model of scientific event interest, we use a two-step procedure. First, we gathered data from a population of scientists to assess their perception of the quality and interest of scientific events. Then, we fitted an auto-regressive model to this data.

[1] Please fill in the blanks with your favorite scientific treat.
[2] Lucky you!, reader.

2.1 Data collection

We asked a large panel ($N = 47$) of scientists of all ages (mean = 39.1, standard deviation = 84.9) to describe their recent experiences. Subjects were asked to grade the past events on a scale ranging from 1 to 10. Exceptionally, they were allowed to attribute the grade 0 to an event, but this had to be strongly motivated and justified. During data collection, subjects were allow to move freely, as well as to think freely. Free speech [3] was also encouraged. Comic strips were provided to break the ice [1]. The subjects were **not** pressured, harassed, threatened, molested, annoyed, ragged, irritated, disturbed, bothered, or slapped during data collection. In short, the subjects did not mentally or physically suffer[3].

2.2 Model

The auto-regressive model we are using can be written as:

$$A(z^{-1})y(t) = sig * e(t) \tag{1}$$

where $e(t)$ is a 1-dimensional white noise with variance 1, and where $A(z) = 1+a_1*z+...+a_r*z^r$ a polynomial function describing the auto-regressive nature of y. r is the model order. We initially though that getting an optimal estimation of r would give us some headaches, but it turned out that the amount of past scientific events that the subjects could remember was surprisingly small: 3 in average. With only 3 data points $y(t)$ over time, it was a no-brainer, and we set $r = 3$ to capture the full complexity of the data.

As one can notice, the chosen model is purely auto-regressive, thus taking into account no external input (only the variable of interest, the interest y, does play a role). In that sense, we acknowledge that the acronym chosen for our method, namely SISO-SIG, may be slightly misleading, since it could be confused with a Single-Output-Single-Output SIGnal model. We apologize for the inconvenience.

3 Results

3.1 Data analysis

At first sight, the grades distribution (see figure 1) follows a nice gaussian distribution. However, and quite strangely, it also displays a clear peak for grade 10. The only explanation we could come up with was that a large number of events do feature high quality wine in paradise locations.

3.2 Model fitting and predictions

Model fitting The model from equation 1 was fitted to the data using the algorithm described in [4]. Identified coefficients for polynomial function A are reported in table 3.2.

[3] To the author's best knowledge.

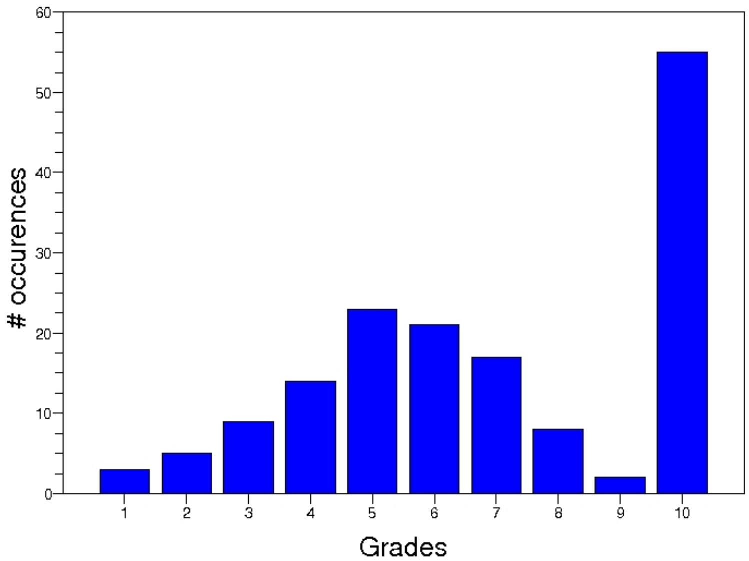

Fig. 1. Distribution of grades

Coefficient order	1	2	3
Value	- 0.0967284	- 0.0204738	- 0.2176203

The structure of the coefficients indeed unveils that the interest of the antepenultimate scientific event is the most important. This could have been expected, considering the following that scientists attend in average 2.87 conferences/workshops a year. Most of these events occur every year, generally in the same order. This means that after about 3 scientific events, you are likely to come back to the antepenultimate one you attended. As a consequence, the third-order coefficient naturally predicts accurately the next event that is likely to occur.

Predictions The quality of predictions is shown by Figure 2. This figure was made possible thanks to an exceptional scientist who could remember up to 14 scientific events (!), much more than the average of 3 we used to set the model order. We are extremely grateful to this person, and would have really liked to slice his brain to digg out neural correlates of this wonderful memory, but this unfortunately was running against our ethical policy (see section 2.1 for details). The correlation between actual and predicted values was found to be $R = 0.9919651$.

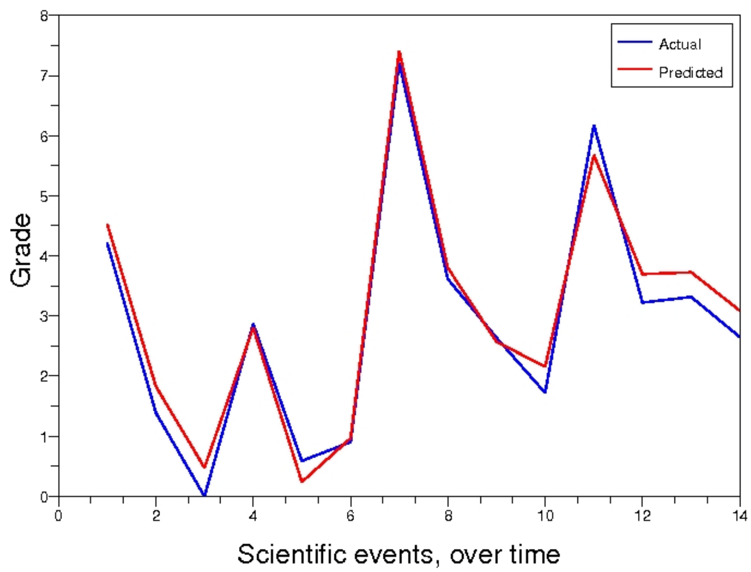

Fig. 2. Scientific event interest: actual (blue line) and predicted (red line) by the model

4 Discussion

We built a SISO-SIG model that can accurately predict the scientific event interest. If one remembers the recent history of his/her attendances, then this model can be used as supplementary information to decide whether or not he should be going to the next event. One limit of this model is to be discussed. According to Murphy's law [2], if things can go wrong, they will. One well-known consequence of this law is that if one washes his car on a given day, it is likely to rain the day after to get the car dirty again.

Knowing this, and if plants and lawn have to be watered, one might think that it is worth washing his/her car instead of watering the garden (because easier), in the hope that this will get the rain to come, hence freeing him/her from watering the green elements. This is flawed reasoning: going back to Murphy's law basics, *if things can go wrong, they will!* In the {car & garden} system, this probably means that it will not rain the day after, but that the car will get dirty anyway (One can imagine a situation involving a dust truck, the above-mentioned car, and an oyster crossing the road[4]), or worse, broken (One can for example imagine the same situation a couple of seconds afterward). Applied to our problem, this means that if we try to predict the interest of the next scientific event to come, this will change the very outcome of this event. This obviously has intricate links

[4] Though this might seem convoluted, we refer the reader to supplementary figure 3.

with quantum mechanics and Heisenberg uncertainty principle, but can also be stated as the following: if the next scientific event is predicted to be terribly boring, and for this reason you do not go, obviously the prediction is still valid, since you have not attended the meeting, thus leaving the history of recent events you attended unchanged. This means that the next one you will attend will be anyway as boring. The conclusion can be stated as the following: you might as well go even if it is predicted to be boring. At least, there are chances that the one after that might be a great one!

Fig. 3. Warning: Possibility of oysters crossing the road

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