CALT-68-θ
DOE RESEARCH AND
DEVELOPMENT REPORT

Stuperspace

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We prove, once and for all, that people who don't use superspace are really out of it. This includes QCDers, who always either wave their hands or gamble with lettuce (Monte Zuma calculations). Besides, all nonsupersymmetric theories have divergences which lead to problems with things like renormalons, instantons, anomalons, and other phenomenons. Also, they can't hide from gravity forever.

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‡On leave of his senses.

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Whatever it is, I'm against it.

Groucho Marx

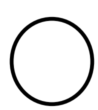
Supersymmetry is the wave (particle) of the future in high energy physics [1]. Even people who used to do stuff like INTESTINEs and panavision are now doing super-INTESTINEs [2] (GUT supe) and superpanavision [3]. Gravity people are running out of ideas, too. Although they have progressed from classical calculations to medieval ones [4], modern calculations are impossible without supergravity due to the well-known X-ray divergences [5]. (As we all know, X-rays travel along parallel lines, which never diverge.) Also, supersymmetric theories are the most symmetric, which makes them the prettiest, so they've got to be right. Chances are they'll give confeynman, too, since with 1073741824+1073741824 components [6] there's no room left for quarks to be free (microwave segregation) [7].

Superspace [8] is the greatest invention since the wheel [9]. It far surpasses all other approaches to supersymmetry [10], like Chevrolet cohomologies [11], Reaganomic symmetry [12], tensor arithmetic [13], and maiden forms [14]. It is also a very compact notation: e.g., a superfield equation $\phi = D\psi$ (as in, e.g., a $D\psi$ of relief) would in components be [15]

$$q\ t + {}^*(\&\%/137\cdot) \int \overleftarrow{d^4} \longleftrightarrow = \lim_{Bonzo \to college} e^{dx} \bigwedge \overleftrightarrow{v} \dot{A} \blacksquare \tilde{U} \S^\circ K \sqrt{5}$$

$$\cdot \mu^{\nu^\sigma} \not{\partial} \overline{z'} \not{\nabla} b \bigoplus c \bigotimes (x\ ,y\ ,z)^\theta |/\_\ \$ - \#!?! \Rightarrow \quad \Leftarrow\ 🔔 \uparrow \downarrow \emptyset$$

Furthermore, component formulations leave out components needed to make nice even numbers like 1073741824 [16]. Superfields also allow the use of supergraphs [17], which give amazing cancellations like the 1-loop vacuum bubble:

 $= 0$.

We use the following notation: Greek letters for vile spinor indices, Roman letters for isospin indices, Cyrillic letters for vector indices, Hebrew letters for 10-dimensional vector indices, Roman numerals for Dirac spinor indices, and radiation therapy for Hodgkin's disease. Also, we use the metric

$$(+--+-+++--+-+\times\div=\to\leftarrow/\bigoplus\bigotimes--).$$

We begin by avoiding a discussion of the following relevant topics: fire beens [18] (satisfying the Old McDonald nullity relation $e_i e_i = 0$), actual gauges [19], ice-cream-cone gauges [20] (the dull plain formalism), petroleum derivatives [21] (in off-Shell formalisms), nonabelian Wind-Mills [22], dimensional irregularity [23] (and the physic of magnetic flux), phenomenological anomalies [24], barefaced Lie algebras [25], and the coffee-ground field method [26]; not to mention such important topological theorems [27] as: a black hole has no hair (the "Fuzzy Wuzzy" theorem), you can't comb the hair on a billiard ball, you can't lasso a basketball, you can't peel an orange without breaking the skin, you can't make an omelet without breaking eggs, you can't push a rope, you can't roller-skate in a buffalo herd, and you can't take a shower in a parakeet's cage.

We can derive the effects of soft breaking (as opposed to heart breaking) of supersymmetry by using the supersymmetric generalization of the Treiman-Goldberger, Adler-Weisberger, McDonald-Hamburger relations [28]. In the nonperturbative case [29], this follows from an analysis of the supersymmetric Yang-Mills field strength $F_{\mu\nu\, SUSY}$ (like $I_{\nu\, SUSY}$). To perform this analysis we study representations of the Lorentz group $SO(3,1)$ and its little group $_{SO(3,1)}$. These are relevant to the largess behavior of the latter graphs [30] which, when plugged into the Chile-Saltpeter equation [31], determine the Bluejay trajectories of the bound states [32]. Of course, this approximation is only valid at energies of 10^{20} GeV (or 6 months, whichever comes first). At low energies, we apply the Low low-energy theorem [33], which determines the value of the coupling, up to a constant. In order to avoid the problem of flavor-changing currants [34], and to prevent an omelet [35] in these currants, we must introduce a number (175) of arbitrary constants, but these are easily fixed by the method of automatic fine tuning. As usual, intermediate vector bosons become massive by eating Kibbles [35½].

All these results will appear in a forthcoming paper [36]. Here we develop the necessary formalism. Contrary to the opinion of certain people, who shall remain nameless [37], it is absolutely necessary to use superfields. (Besides, components are in bad taste [38].) We will not here review the results which by now should be known to everybody (if not, shame on you!), and refer the forgetful reader to the appropriate references [that's what all these funny little numbers are for]. We begin with the Bronchial identities [39] as applied to N=8 supergravity [40] with SU(8) at the local level, E(7) at the global level, and increased taxes at the state and national level [41]:

$$\nabla_5 R^{mag}{}_{\delta\sigma reg} \otimes \Upsilon_{\dot\alpha\dot\beta\cdots} \int d^4p\ e^{[42]} =$$
$$L_{G\,reco} + 5 + \not{\partial}\hat{\Lambda} + \check{V} + 2^{256}\alpha_S(\mu^2)\ , \tag{3.14159}$$

where we have used the approximation $2\pi i \simeq 1$. Upon linearization [43], this reduces to

$$\scriptstyle \nabla_5 R^{mag}{}_{\delta\sigma reg} \otimes \Upsilon_{\dot\alpha\dot\beta\cdots} \int d^4p\ e^{[42]} =$$
$$\scriptstyle L_{G\,reco} + 5 + \not{\partial}\hat{\Lambda} + \check{V} + 2^{256}\alpha_S(\mu^2)\ . \qquad (3.14159)$$

These identities are useful for studying *divergences* [44]. However, background fields must be used [45] in order to avoid noncovariances due to ghosts [46]. Of course, we consider here only the minimal set of auxiliary fields: Generalization to other cases [47] is straightforward and a waste of time. For convenience (ours, not yours) we restrict ourselves to on-shell background fields, which is sufficient for our purposes (namely, getting this paper written). These results can also be easily exteneded to the case of nonvanishing cosmological constant [48], but since we all know it vanishes anyway, who cares? Anyway, we find the following tax-deductible contributions to the effective action (the generating functional for green functions which are one-particle, irreducible, with liberty and justice for all), coming mostly from the Bermuda triangle graph (fig. 1):

$$\Gamma = \int d^4xd^4\theta \, (k_1 L + k_2 M + k_3 N +$$

$$k_4 O + k_5 P + k_6 Q + k_7 R + k_8 S + k_9 T) \ ,$$

where O=0, R and L are the Ricci and Lucy scalars, k_4 and k_5 are the Betti and Veronica numbers, k_2 is a mountain, k_3 is a manifold, and k_9 is a dog. These coefficients can be calculated by the heat-kernel (pop-corn) method.

We now study the nonperturbative effects. These are actually easier to study than the perturbative effects because they cannot be calculated and thus we can wave our hands a lot more. We consider N=4 General-Mills because it is conformally invariant [49], so its asymptotic justice gives agreement with the phenomenomagically verified Dolly parton model [50] (as applied to quacks which are either fermions or bosoms). Brojken scaling [50½] produces a diletante field by the Silverrock mechanism. The leading high-energy behavior is described by the Woodchuckon [51], which is represented by a tube of toothpaste, whose strength and direction is given by the Dysapoynting vector $R \otimes R$. These lines of toothpaste can be identified with the relativistic dental floss of fool models.

As an illustration of all these wonderful properties, we consider the following (by causality) example: N=8 supergravity bound states. These states are easily determined by applying the supersymmetry generators to the Hoover vacuum, using the restrictions imposed by the supersymmetric generalization of the Colon-Mandolin theorem [52]. Before performing this calculation we will need to introduce some notation. We label spacetime coordinates as

$$(x, y, z, t) = (parsley, sage, rosemary, thyme) \quad .$$

For Fineperson graph calculations, we Candle rotate and do a 4EA transform (or a DEA transform in order to allow Dmensional regularization). Of course, after Candle rotating, a spinor is not directly related to its hermichigan conjugal. We then use path integrals (no relation to math integrals) to defeyn the green functions (red functions do not propagate). Since we are talking about supersymmetry (remember?), we need to integrate over anticommunist variables, performed by use of Emberezin integration. By component methods, one would first go to a Vaselino gauge [53] and eliminate all auxiliary fields (such as the scalar and pseudoscalar fields S+iP) [54]. However, one must avoid such unitary gauges for nonperturbative purposes. For our nonperturbative calculation a useful approximation is the large N expansion. This is far more accurate here than in QCD because 8>>3. Using superfields, the calculation is trivial, so we will just quote the result:

$$\Gamma = \text{☎}^{-1}\Psi\bar{\Psi} \ ,$$

where ☎ is the telephone operator. (When acting on the vacuum, it produces a dialatone state.) Comparing with the predictions of Regge uncalculus [55], we find that the Palmer&Charleson is actually the graviton. (No wonder it's schizophrenic.)

Acknowledgments

We would like to thank A.Einstein; unfortunately, he's dead.

Noted added in proof

After this work was completed, we became aware of ref. 56, in which none of these results were derived.

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Fig.1: Bermuda triangle graph

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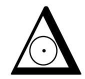

novus ordo seclorum