# THE "DEISTIC MAXIMALISM PRINCIPLE"

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### *Abstract*

*The Deistic Maximalism Principle (DMP) is the idea that a universe designing hyper intelligence (a deity) uses the largest (maximal) example of a mathematical type (e.g. "E8" of the exceptional semisimple Lie algebras, or the "Monster" of the exceptional finite simple groups, etc) in its design of the structural, functional, mathematical principles of the universe. This strategy allows the deity the maximal number of options in its design.*

A couple of years back, I was reading through one of my texts on Lie Groups and Lie Algebras (one of the most beautiful branches of pure math) and came across the following sentence which made me take notice -

"*As to the exceptional algebras*" (i.e. G2, F4, E6, E7, E8) "*the convinced Deist would have to believe that these algebras are destined to play an important role in the foundations of physics, and indeed investigators into the theory of elementary particles have lately begun to show interest in the exceptional Lie groups*" (e.g. one of the five pre M-theory string theories, E8 X E8)

My immediate thought was that "these two authors (Hausner and Schwartz) think along the same lines as I do." This got me thinking. A bit later, while studying the exceptional finite simple groups, I came across papers by Borcherds, a Cambridge-Berkeley, pure mathematician and Fields Medal winner who linked the Monster group (the $10^{54}$ membered and largest of the exceptional finite simple groups, i.e. groups that cannot be decomposed into smaller groups, rather like primes to integers, or atoms to molecules) to a 26 dimensional string theory.

This really got me wondering. I've been thinking for quite a few years that the universe, i.e. the laws of physics, are so deeply embedded in mathematical principles (what I call the "Mathematical Principle") that I've become more and more open to the idea that our universe has been designed by a hyper intelligence using advanced mathematics. Common sense told me, "Well, if I were such an hyper intelligence, I would probably use the *largest* example of the type of mathematical structure (e.g. exceptional Lie Algebra, exceptional finite simple group etc) I was considering in my universe design, because that would give me more options than a smaller example (e.g. for the exceptional Lie algebras, E7 or E6, and for exceptional finite simple groups, any of the other 25 in the list, e.g. the Baby Monster, or the Conway groups, etc.)

The exceptional Lie algebras and the exceptional finite simple groups were two clear examples of advanced math being needed to explain how the universe works. There are others. In many of these cases, nature uses the largest (maximal) example of the mathematical structure concerned. Why is that? Why not use a smaller example, e.g. SU(3) is used in the classification of the elementary particles. SU(3) i.e. the special unitary group of dimension 3, is very small compared to SU(N), where N could be any very large positive integer. But, the type of group SU(N) has an *infinite* number of examples. The two examples I have been discussing are both "exceptional" types. Maybe that's the clue. If the hyper intelligent universe designer is going to use an exceptional mathematical type, it would probably opt for the largest one (the one with the largest number of members or elements).

This kind of thinking led me to reformulate the "***Deistic Maximalism Principle***" a little more precisely, namely, "*When a hyper intelligent designer of universes uses mathematical entities of exceptional type (e.g. the exceptional Lie algebras, or the exceptional finite simple groups, etc) to help it in its design work, it will choose the largest example of the exceptional type it is using*."

This is a hypothesis, a conjecture. To confirm it, or refute it, further examples of exceptional mathematical types need to be examined as well as their use in mathematical physics.

I've always been fascinated by "classification proofs" in math. Pure mathematicians love to classify mathematical types, because there is a wonderful finality, and completeness about a classification proof, which I need to explain a bit here. Imagine you are Evariste Galois, the 20 year old French mathematical genius who stupidly got himself shot in a duel, who gave the world, group theory and Galois theory. He had discovered that there were groups that could not be decomposed into simpler ones. In other words, he discovered the concept of the finite "simple" (i.e. indecomposable) group. A few decades later a few more were discovered by another French mathematician called Mathieu. A century passed before the next one was found, and then all hell broke loose. Soon there were more than 20 of these exceptional finite simple groups known.

The obvious question occurred to pure mathematicians, "Can we classify these exceptional finite simple groups?" i.e. can we make a complete list of them, and then prove with a rigorous mathematical proof, that there cannot exist any others that do NOT exist in the list, i.e. proving that the list is complete?"

Classifying the finite simple groups was one of the greatest achievements in human history, and was only finished in 2004. The general public hasn't heard about it, because it is advanced pure mathematics, that only a tiny percentage of people are smart enough to understand it, so this pinnacle of human intellectual achievement is almost exclusively unnoticed. It was a gargantuan half century effort involving about a hundred mathematical researchers, spread over about 500 research articles and about 10,000 pages. Eventually 26 such exceptional finite simple groups were found, and the

classification proof that there cannot be any others, was finalized in 2004, mopping up the last of the loose ends (i.e. the so-called "quasithin groups").

The largest of these exceptional finite simple groups is called the "Monster" with nearly $10^{54}$ elements or members. Its structure is so rich, that mathematicians are still far from having mined all of its secrets, of which there are many, because it has links to many other branches of math, e.g. number theory, mathematical string theory, etc.

When I learned that Borcherds had linked the Monster to a 26 dimensional string theory, I was fascinated. It made me a bit more of a deist. Why on earth should nature be describable in terms of such an obscure and difficult piece of pure mathematics???? I became ever more suspicious that the universe was designed.

I am not alone in thinking that increasingly obscure pure mathematics will play an increasingly important role in mathematical physics. Besides Hausner and Schwartz, mentioned above, Freeman Dyson, of QED (quantum electrodynamics) fame, also thought that the Monster group was destined to play a major role in $21^{st}$ century mathematical physics. He is quoted as saying (before he heard of Borcherd's work in the 1990s) "I have a sneaking hope, a hope unsupported by any facts or any evidence, that sometime in the twenty first century physicists will stumble upon the Monster group, built in some unsuspected way into the structure of the universe."

Now that you have an idea of what a classification and a classification proof is, I suggest a collective effort now be made to assemble a list of mathematical structures that have classification proofs, and to see whether they have finite exceptional members in the list. The next step would be to see whether the exceptional members of these mathematical structures are used in mathematical physics, and especially whether the exceptional members used are maximal.

Would such use be universal? Probably not. There will probably be counter examples, but at the time of writing, I'm not sure if that's true. There may be many positive examples, e.g. the two I've given above, so at least the Deistic Maximalism Principle (DMP) may be partially true. If you're a hyper intelligent creature capable of designing and building universes, you may not feel the obligation to obey the DMP strictly, but use it only as a rule of thumb (speaking metaphorically.)

So, if you're a mathematical physicist with a strong mathematical knowledge, perhaps you can contribute to this quest. How many further examples (or counter examples) of the use of this principle can you find?

If the DMP becomes a lot stronger in a few years, will that make mathematical physicists more open to deism? Will scientists look upon the nature of science differently, e.g. considering it not only the enterprise that examines what *is*, but also examining what is *designed*, and what the designs are??? Perhaps everything is designed!? Fascinating questions.