

Dr. N on God particle



Dr. McKinney worked several years in cancer research at the BC Cancer Research Foundation. Part of that research was in particle physics at the TRIUMF cyclotron at UBC.

The primary magnets of the Tri-University Meson Factory Cyclotron

Protons were accelerated to near light-speed, crashed into a carbon target, and the pi mesons that resulted (picked from the “subatomic wreckage”) were collected magnetically into a beam for cancer therapy. This delightful article from the Washington Post is a response to the new discoveries at the big cyclotron in Europe. Too many scientists seem to hold to a view of a cold, empty universe in which we are a biological scum on a mote of dust into the middle of nothing. This nihilistic viewpoint removes meaning and allows science to proceed down paths lacking in conscience, morality, social responsibility and hopefulness. Here we have a counter-vailing point of view that makes a case for a universe with space for consciousness, spirit, and human values.

The search for the God particle goes beyond mere physics

The God particle — really the Higgs boson — still resists confirmation, though scientists at the Large Hadron Collider recently reported “tantalizing hints” of its existence. They also reject the notion that their search has anything to do with God, which is only technically true.

Modern physics can explain just about everything, except why anything has mass. The Standard Model of physics, which emerged four decades ago, employs an elegant mathematical formula to account for most of the elemental forces in the universe. It correctly predicted the discovery of various leptons and quarks in the laboratory. But the equation doesn't explain gravity. So the Standard Model requires the existence of some other force that seized the massless particles produced by the Big Bang and sucked them into physicality. The detection of Higgs bosons would confirm this theory — which is why scientists are smashing protons into one another in a 17-mile round particle accelerator and picking through the subatomic wreckage.

It will take a few more years for definitive results. But most scientists don't seem to appreciate the glorious improbability — and philosophic implications — of the entire enterprise.

In 1928, theoretical physicist Paul Dirac combined the mathematical formulas for relativity and quantum mechanics into a single equation and predicted the existence of antimatter.

Antimatter was duly discovered in 1932. But why should a mathematical equation — the product of brain chemistry — describe physical reality? It is not self-evident that there should be any correspondence between mathematical formulas and the laws of the universe.

Modern physics does not consist of measured phenomena summarized in elegant equations; it consists of elegant equations that predict measured phenomena. This has been called “the unreasonable effectiveness of mathematics.” However unreasonable, it led to the construction of the Large Hadron Collider along the border of France and Switzerland, the largest machine ever built by human beings.

Dr. Ard Louis, a young physicist teaching at the University of Oxford, recalls his first encounter with Dirac’s equation. “How can mathematics demand something so fantastical from nature? I was sure it couldn’t be true and spent many hours trying to find a way out. When I finally gave up and saw that there was no way around Dirac’s result, it gave me goose bumps. I remember thinking that even if I never used my years of physics training again, it would have been worth it just to see something so spectacularly beautiful.”

Louis describes a cumulative case for wonder. Not only does the universe unexpectedly correspond to mathematical theories, it is self-organizing — from biology to astrophysics — in unlikely ways. The physical constants of the universe seem finely tuned for the emergence of complexity and life. Slightly modify the strength of gravity, or the chemistry of carbon, or the ratio of the mass of protons and electrons, and biological systems become impossible. The universe-ending Big Crunch comes too soon, or carbon isn’t produced, or suns explode.

The wild improbability of a universe that allows us to be aware of it seems to demand some explanation. This does not require theism. Some physicists favour the theory of the multiverse, in which every possible universe exists simultaneously. If everything happens, it is not surprising that anything happens. But this is not a theory that can be scientifically tested. Other universes, by definition, are not accessible. The multiverse is metaphysics — just as subject to the scientific method as the existence of heaven.

One reasonable alternative — the one advocated by Louis — is theism. It explains a universe finely tuned for life and accessible to human reason. It accounts for the cosmic coincidences. And a theistic universe, unlike the alternatives, also makes sense of free will and moral responsibility.

This is not proof for the existence of God. But the conflict here is not between faith and science; it is between the competing faiths of theism and materialism, neither of which can claim to be proved by science. Modern physics has accelerated smack into the limits of the scientific method. It raises questions it cannot answer but that human beings cannot avoid — matters of meaning and purpose. This is not a failure of science, just a recognition that measurement is not the only source of meaning.

Our response to nature’s astounding symmetries is not only rational but aesthetic. Some, like Louis, feel goose bumps and thankfulness. Others are angered by such sentimentalism. Yet this would be a sad epitaph for modern science: It revealed wonders but was numb to wonder.

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A human being is a part of a whole, called by us "universe", a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest... a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. ~ **Albert Einstein**