

1978

## 1980 ISEF Logo Theme Is New Physics

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*Minnesota Zoo*

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### Recommended Citation

Taylor, A. (1978). 1980 ISEF Logo Theme Is New Physics. *Journal of the Minnesota Academy of Science*, Vol. 44 No. 1, 19-19.

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# 1980 ISEF Logo Theme Is New Physics

Alex Taylor\*

When his ship falls into a black hole in space, Adam Quark and his crew meet their evil counterparts from another universe. This scenario is typical of the recent appearance of television programs, albums and books inspired by the new physics. Black holes, cosmic forces, anti-matter, strangeness, truth and beauty make up the arcane world of high-energy physics and astrophysics. These terms delight the popular imagination and welcome us to the realm of sub-atomic particles called Quarks.

Back in the late 30's, electrons, protons and neutrons were considered the building blocks of matter. By 1947, our knowledge of the atom had advanced far beyond the H-bomb. Theories developed about anti-matter, new forces stronger than electric or gravitational force, heavy particles and the amazing neutrino, capable of passing through ordinary matter. Murray Gell-Mann, a physicist at the California Institute of Technology and other theorists proposed that all heavy particles of nature were made up of three kinds of smaller particles. He named the three Quarks, a word from a phrase of James Joyce: "Three Quarks for Muster Mark".

As described in Nidgel Calders recent book, *The Key to the Universe*, (Viking Press, 1977) the three quarks are symbolized as follows:



upward moving particles



downward moving particles



strange particles

The color indicates forces effecting each particle's behavior, and metaphorical labeling of its chromodynamic interactions within the proton. Strangeness describes a quality affecting the lifetimes of particles.

Recent discoveries made at the giant accelerator laboratories in the United States and Europe have confirmed these theories about the building blocks of our universe. High energy accelerators smash electrons into protons and the reaction is recorded on film. Details of the scattering imply encounters with unseen objects (quarks) inside the protons. The fourth and newest quark particle, charm, is the most illusive and is detected only by its absence.



charm

Designing a logo to represent a project as large as the 1980 Minnesota International Science and Engineering Fair requires a symbol versatile enough to accommodate advertising, poster, brochure and stationery designs. Equally important, the logo should signify the progress being made by our scientific and engineering communities. Quark symbols satisfy these requirements and allow for colorful and attractive graphic designs.

\*ALEX TAYLOR is exhibits designer at the Minnesota Zoological Garden, in Apple Valley. He received a BFA degree from Arizona State University. Prior to joining the Minnesota Zoo staff, Alex worked as Art Director for the Phoenix Zoo.