

High Energy Juggling

As you are all aware, significant advances have been made recently in the field of high energy juggling, so it is probably time to discuss the impact of this on both the theoretical and the practical juggler.

High energy juggling involves the use of anti-balls, as well as balls, in juggling patterns. If a ball and an anti-ball are caught in the same hand at the same time they will mutually annihilate with some minor side effects that are beyond the scope of this article. Conversely, given the right setup, a ball/anti-ball pair can be spontaneously generated without violating the Law of Conservation of Balls.

Prop-makers are rushing to be the first to market anti-balls. Brian Dube' will be selling them as soon as his patent is confirmed, Todd Smith will start production as soon as Dube' makes one for him to copy, and the Renegades had a batch shipped from Europe, but unfortunately they were packed alongside regular balls and the crate arrived empty. Jugglebug say they will not be producing anti-balls as their props regularly self-destruct without outside assistance.

Of course, the critical question facing the juggling community is, "How does high energy juggling affect site swap theory?" As it turns out, the modification required is simple and elegant. The single low energy quantum juggling event (or jug) {catch ball/throw ball} is replaced by four possible jugs:

{catch ball/throw ball}

{catch ball/catch anti-ball}

{throw ball/throw anti-ball}

{catch anti-ball/throw anti-ball}

All these jugs start and end with the hand empty. Low energy site swap notation records the throw ball part of the jug, and the catch is assumed. High energy site swap notation records either the throw ball or the catch anti-ball - note that every jug must contain one or the other of these events. However, since catching an anti-ball is the result of a thrown anti-ball earlier in the sequence, a catch anti-ball event in site swap notation is represented by a negative number. (It may help you to grasp what is going on if you regard an anti-ball as a regular ball which is thrown backwards in time, and arrives before it was tossed.)

Let's look at some high energy site swaps. There are a number of interesting zero ball patterns which are useful if you forget your props. 1-1 is the spontaneous creation of a ball/anti-ball pair which are passed to the other hand and annihilate each other. 3-3 is the same thing, but the pair are tossed to the other hand, so that there are a couple of pairs in the air at the same time. 333-3-3-3 is a pleasingly symmetrical variation of the same thing. In 4-2-2 the hands take turns creating a pair, tossing the ball in the air and holding the anti-ball until it comes down. Of course, for every pattern there is an anti-pattern, so -422 is also valid. An excellent way to confuse your audience is to do -3-2-10123 in a Mills Mess pattern. Some jugglers may find difficulty with -1 throws. A good exercise is to work on the sequence 2-1-1, 3-1-1-1, 4-1-1-1-1, 5-1-1-1-1-1

Consider the one, two, three and four ball high energy showers: 3-1, 5-1, 7-1, 9-1. If you look at the balls in the air, these appear the same as the two, three, four and five ball low energy showers. However, instead of a 1 throw passing a ball from left to right, a -1 throw passes an anti-ball from right to left.

50-2 is probably the most interesting thing you can do with only one ball. Check it out.

Several professional jugglers are planning to incorporate high energy work into their routines. Michael Moschen is abandoning his one ball routine (which is mostly 20, with occasional bursts of 1) in favor of a zero ball routine which is based on three months in the Maine woods contemplating the heat death of the universe. This consists entirely of 2-2, except for the ending which is a triumphant 2-22-21-200000000000. Neil Stammer has been using anti-balls in his three ball routine for years, but he moves so fast you can't see them due to Heisenberg's Uncertainty Principle. Albert Lucas is planning to run a marathon backwards juggling anti-exerballs, because, as he puts it, "People seem much happier to see the back of me."

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