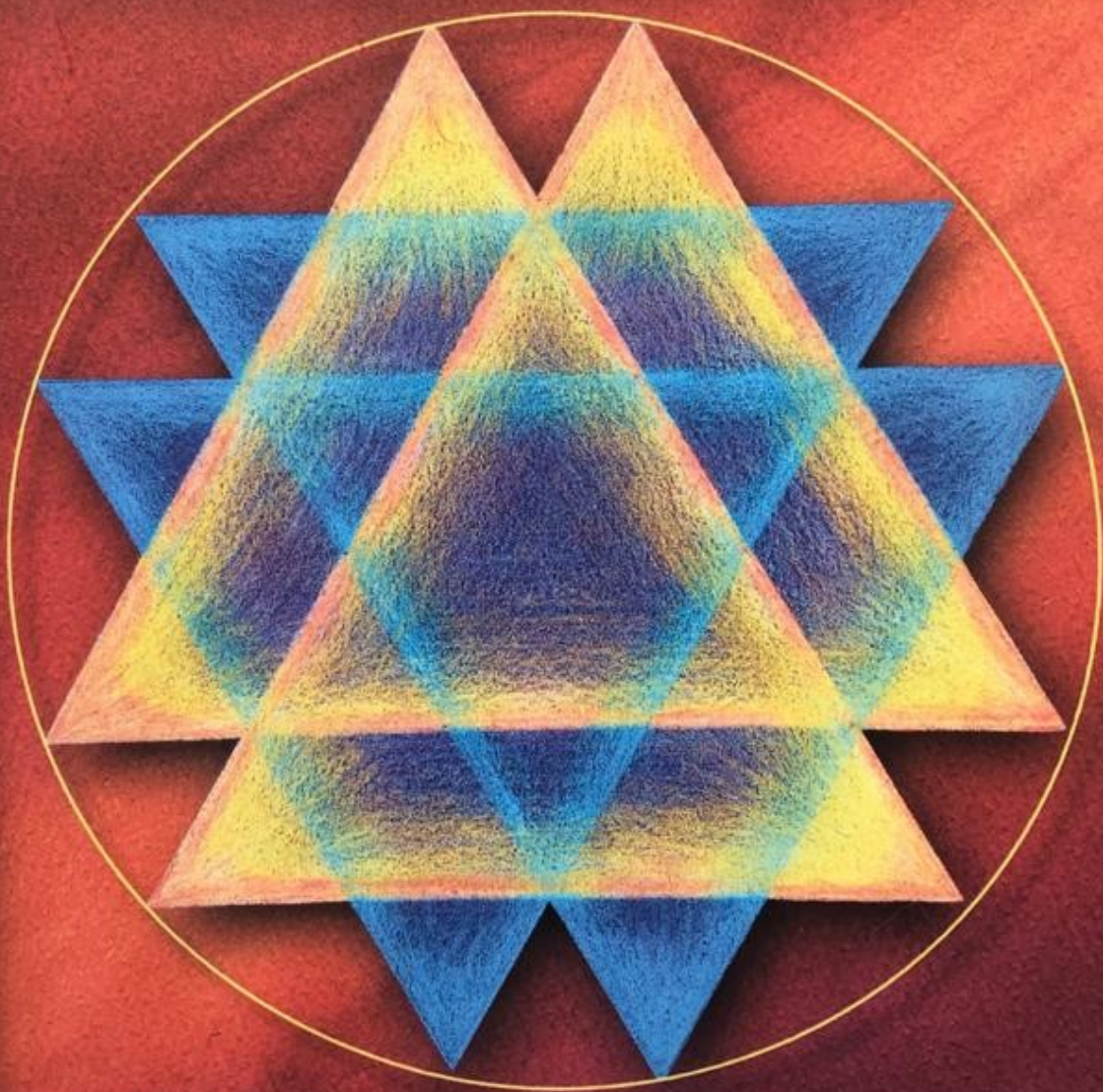


# THE ZEN OF MAGIC SQUARES, CIRCLES, AND STARS



CLIFFORD A. PICKOVER

number in the magic square by 6, a new magic square is obtained with  $S = 111$ . What other amazing features can you find?

### The Kurchan Square

Another amazing magic square is the *Kurchan square*, named after its discoverer, Rodolfo Marcelo Kurchan from Buenos Aires, Argentina.<sup>9</sup> He believes this to be the smallest, nontrivial magic square having  $N^2$  distinct pandigital integers and the smallest pandigital magic sum. *Pandigital* means all ten digits are used, and zero is not the leading digit. Following is the awesome Kurchan Array; the pandigital sum is 4,129,607,358:

1,037,956,284	1,036,947,285	1,027,856,394	1,026,847,395
1,026,857,394	1,027,846,395	1,036,957,284	1,037,946,285
1,036,847,295	1,037,856,294	1,026,947,385	1,027,956,384
1,027,946,385	1,026,957,384	1,037,846,295	1,036,857,294

The Kurchan square

### Mirror Magic Square

Those of you who enjoy playing with mirrors and kaleidoscopes will be in awe of the mirror magic square:<sup>10</sup>

96	64	37	45
39	43	98	62
84	76	25	57
23	59	82	78

Mirror magic square