Conway's Game of Life luckily includes more interesting patterns than still lifes and oscillators. It wouldn't be such a computational phenomenon if those patterns were as interesting as it gets!

In fact, there are thousands of documented patterns in the Game of Life universe, most with a variety of information about them including how many generations it takes for them to become stable, what patterns appear at that stable state, what interesting patterns appear while they are running, and what can be added to the patterns to manipulate their productions in the game.

The first 'interesting' patterns appeared shortly after Conway invented Life. At the beginning he figured out the patterns by hand, but soon came to one that did not stabilize soon enough for him to capture by hand. This famous pattern is called the R-Pentomino. The best way to understand the amazing result of this beginning pattern is to watch it in a Java applet.

R-Pentomino

It is wildly unstable, with each generation different from it's predecessor and containing within its lifetime many oscillators and still-lifes. It actually takes 1103 generations for the R-Pentomino to become stable. However, there is something different about the way the R-pentomino stabilizes than the way Conway thought all patterns would end. The R-pentomino was the first pattern to shoot off 'gliders' which were patterns that continued on a trajectory away from the central pattern forever. The R-Pentomino was the first pattern to be found that was not finite in it's movement!

The R-pentomino's final constellation consists of 25 objects (8 blocks, 6 gliders, 4 beehives, 4 blinkers, 1 boat, 1 loaf, 1 ship), and the final population is 116 cells - the maximum population of 319 cells occurs in generation 821. This is a phenomenal result from an object that begins with only 5 cells.

The R-Pentomino is greatly responsible for the surge of interest in the game of Life that has lasted the entire 30 years since it's creation.

That isn't the end of our travel though fascinating Life patterns! Two others-the Glider Gun and Puffer Train and exceptional and deserve to be included in the modest category of "interesting patterns".

The Glider Gun

After creating the Game of Life, John Conway offered a $50 prize to anyone who could prove or disprove that an object in the Life universe could grow inifitely large. MIT professor Bill Gosper captured that prize in late 1970 when he invented the Glider Gun. He also invented the first puffer train, which follows in the next section.

This gun 'bounces' back and forth and each time creates a creates a glider that shoots off to infinity. These gliders became the foundation for more complicated unbounded patterns. Lately, a lot of interest and reserach has been concentrated in finding spaceships, which are more complicated gliders, with different periods than the limited group already known. It seems tat one of the large goals in the Life world is to find a complete list of all types of objects and what period and sizes are possible.

The Puffer Train

The puffer train is another pattern that starts out fairly simple, although the 'cooler' ones have a lot of cells involved. What happens is the 'train' starts moving and leaves a trail of mess behind, kind of like the smoke from a train. There are a variety of trains that have been found in the Game of Life universe, and are characterized by their periods and their 'dirtiness' i.e., how much debris they leave behind them. A great looking puffer train can be seen in an applet here. It is by no means the simplest, but creates the best illusion of a real train. Now puffer trains and gliders are being used together to create new exciting patterns that extend and make specific patterns in the Game Of Life universe.

With such amazing things resulting from such a simple beginning, the Game immediately caught the eye and mind of hobbysits, mathematicians, biologists, and computer scientists. The Game is still probably the most programmed 'game' in the discipline.