

10) The combinatorial rules of the filaments 1

(To see the illustrations clearly, put the size to 125%)

This article deals with the numbers of arms of the stars of the main junctions of the buds (or bulbs) attached to the body, the main cardioid. The biggest bud is the head right to the left. Its main filament, the spike, is the only filament that is completely straight. It is considered to be a 2-star! The next bud in the main series is the northern bud (in the following I will deal with the upper half of the set). It has a 3-armed star on the top (in fact it is a very very slow 3-armed spiral). Along the side of the cardioid towards the Aisle the number of arms of the bud is increasing by one for each successive bud and we have to pass infinite many buds before reaching the Cusp (see figure 1, combinatorial 1).

How about the filaments of the buds between the buds of the main series? Here the following rule is stated: Between two successive buds there is always one bud bigger than the rest. The number of arms of this bud is the sum of the number of arms of the two first mentioned buds (figure 2, combinatorial 2). In that way the number of arms of the junctions of every bud can be determined and also besides counted manually. In the sub series of buds along the body towards the Seahorse Valley, the number of arms of the stars therefore are increasing with two for each successive bud.

All cardioids and buds in the entire Mandelbrot set are called "hyperbolic components". Note that the filaments are solely built up of

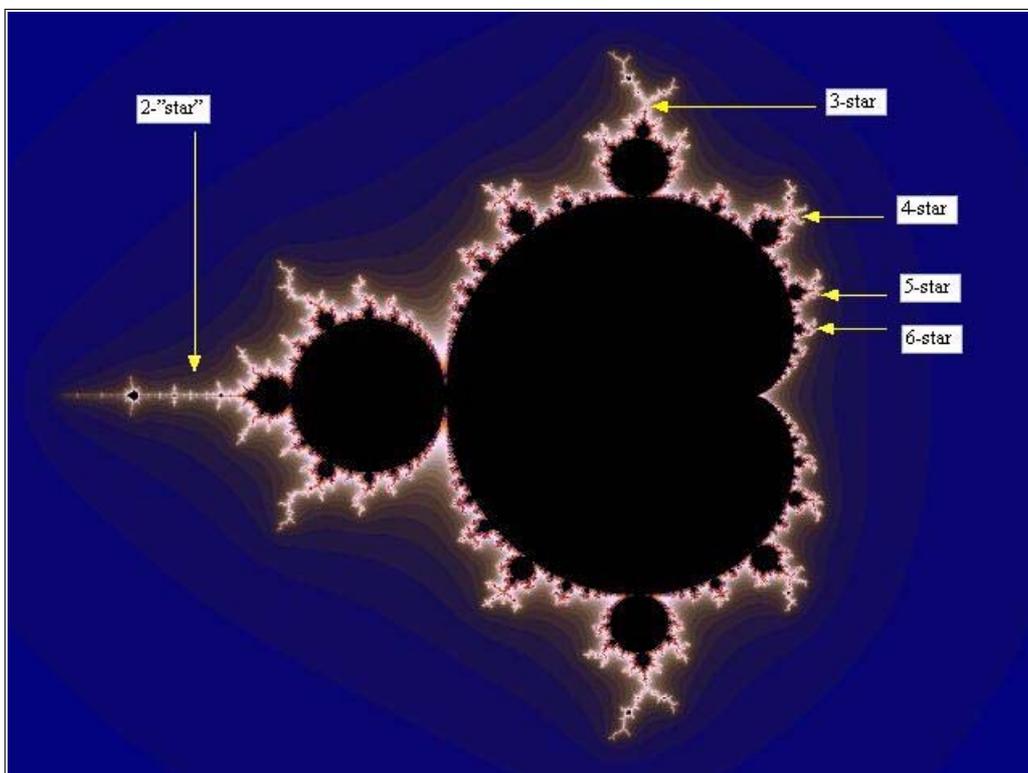


Fig 1.

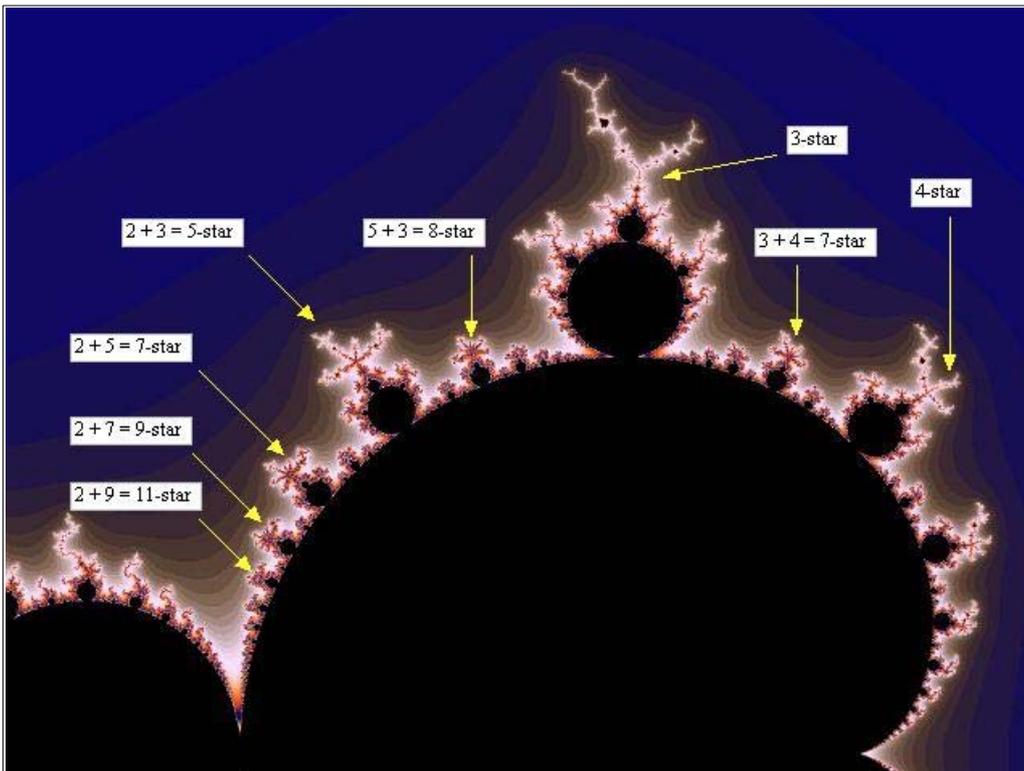


Fig 2.

minibrots. Every hyperbolic component (except the very border) is made up of parameters (c-values) which give rise to a filled-in Julia set with a certain attractive periodic cycle. Parameters from the main cardioid (the body) give rise to 1-periodic filled-in Julia sets, that is every "z" inside the region enclosed by that Julia set has an orbit attracted towards a fixed point. Parameters from the head of the M set give rise to 2-periodic filled-in Julia sets. The northern and southern buds, as well as the cardioid of the biggest minibrot on the spike, give rise to 3-periodic filled-in Julia sets, and so on.

Now the number of arms of the stars of the buds tell the periods of the filled-in Julia sets produced with parameters from these buds in the following way. Buds attached to the main cardioid have periods equal to the number of arms of the stars of the main filaments of the bud in question. Buds attached to the cardioids of minibrots have periods equal to the number of arms of the main filaments of the bud in question multiplied with the period of that cardioid. This will be enough for this time. Maybe this phenomenon will be further described in this chaotic series.

 Regards

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