CLAIMS

WHAT IS CLAIMED IS:

1. An airfoil body comprising:

a plurality of tubercles along a leading edge of said airfoil body; and

a plurality of crenulations along a trailing edge of said airfoil body;

wherein at least one of a position, a size, and a shape of said plurality of tubercles and said plurality of crenulations varies in a non-periodic fashion comprising a Fibonacci proportion.

2. The airfoil body of claim 1 wherein said plurality of tubercles comprises 13 tubercles T1-T13.

3. The airfoil body of claim 2 wherein said plurality of tubercles comprises 8 primary tubercles T1, T4, T6, T7, T8, T9, T10, and T11 having peaks respectively located within about ±0.05 of the following proportions: 0.38, 0.62, 0.76, 0.86, 0.9, 0.95, 0.95, 1.0; said proportions being defined with respect to a maximum span segment between a pivot point located inboard from a root chord of said airfoil body and said peak of said tubercle T11.

4. The airfoil body of claim 3 wherein said non-periodic fashion comprises a modified Fibonacci function as set forth in the following equation:

$$FM_x = \left| \frac{0.1\phi}{\sqrt{5}} \left\{ (\phi)^{-x} - \left(\frac{1}{\phi}\right)^{-x} \cos\left(\left(\frac{360}{137.5} \right) \pi(-x) \right) \right\} \right|^{\frac{1}{\phi}}$$

and wherein said tubercles T1-T13 are configured within about ±0.05 of the SK/W, AF/W, and A/AF proportions respectively listed in the following table:

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13
SK/W	**.45**	**.45**	**.45**	**.45**	**.38**	**.45**	**.45**	**.45**	**.45**	**.5**	**.45**	**.62**	**.62**
AF/W	**.12**	**.26**	**.22**	**.19**	**.38**	**.30**	**.34**	**.30**	**.38**	**.33**	**.45**	**.45**	**.33**
A/AF	**3.24**	**.62**	**1.62**	**2.24**	**.5**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

5. The airfoil body of claim 4 wherein said plurality of crenulations comprises 8 crenulations C1-C8 and further comprising a max chord trailing edge curvature;

wherein said crenulations C1-C8 and said max chord trailing edge curvature are configured within about ±0.05 of the SK/W, AF/W, and A/AF proportions respectively listed in the following table:

	C1	C2	C3	C4	C5	C6	C7	C8	Max chord trailing edge curvature
SK/W	**.38**	**.5**	**.38**	**.45**	**.38**	**.5**	**.38**	**.38**	**.62**
AF/W	**.33**	**.22**	**.19**	**.2**	**.23**	**.16**	**.09**	**.01**	**.11**
A/AF	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

6. The airfoil body of claim 5 wherein at least some of said tubercle peaks are located on a divine spiral.

7. The airfoil body of claim 5 wherein at least some of said crenulations comprise peaks located on a divine spiral.

8. The airfoil body of claim 3 further comprising a root chord of length R intersected by said maximum span segment such that said root chord is divided into a forward segment G and an aft segment, wherein R/G is between about 1.618 and about 3.236.

9. The airfoil body of claim 8 further comprising a plurality of chords having a nonlinear spanwise variation of max chord thickness.

10. The airfoil body of claim 9 wherein said max chord thickness varies within about ±0.05 of the proportions as set forth in the following table:

Max Thickness Proportions	Chord Location									
	25	KR	KB	K1	K2	K3	K4	K5	K6	K9
Max thickness [MT] in proportion to root chord [25] max thickness	1	1.2	.95	1	.84	.79	.71	.70	.62	.21
Location of max thickness [MT] (% from leading edge)	31	32	32	38	26	30	38	37	43	50

wherein said root chord 25 is located by a leading edge point P16;

wherein said chord KR is located by a leading edge point P141;

wherein said chord KB is located by a leading edge point P142;

wherein (P142-P16)/(P141-P16) is about 1.618; and

wherein said chords K1, K2, K3, K4, K5, K6, and K9 are respectively located by leading edge points associated with said tubercles T1, T2, T3, T4, T5, T6, and T9.

11. A method of making an airfoil body having a plurality of tubercles along a leading edge of said airfoil body and a plurality of crenulations along a trailing edge of said airfoil body, said method comprising:

establishing a leading edge point of a root chord of said airfoil body;

establishing a pivot point inboard of said root chord;

establishing a max span point corresponding to a peak of an outermost tubercle;

establishing a peak position of said plurality of tubercles relative to said pivot point based on Fibonacci proportions with respect to a maximum span segment between said pivot point and said max span point; and

making said airfoil body.

12. The method of claim 11 further comprising establishing a max chord trailing edge curvature location using a divine triangle having a first vertex at said pivot point, a second vertex at a first tubercle peak, and a third vertex at said max chord trailing edge curvature location.

13. The method of claim 11 further comprising using one or more divine spirals to locate peaks of at least some of said plurality of tubercles and at least some of said plurality of crenulations.

14. The method of claim 11 further comprising establishing a nonlinear spanwise variation of max chord thickness of said airfoil body.

15. An airfoil body comprising at least one of (a) a plurality of leading edge tubercles arranged in Fibonacci proportions and (b) a plurality of trailing edge crenulations arranged in Fibonacci proportions.

16. The airfoil body of claim 15, further comprising a non-linear spanwise variation of max chord thickness.

17. The airfoil body of claim 16 wherein said airfoil body comprises a root chord and a maximum chord thickness, and wherein said maximum chord thickness is outboard of said root chord.

18. An airfoil body comprising a planform shape defined at least in part by at least one divine spiral, wherein said planform shape further comprises at least one of (a) a plurality of leading edge tubercles arranged in Fibonacci proportions and (b) a plurality of trailing edge crenulations arranged in Fibonacci proportions.

19. The airfoil body of claim 18 wherein said planform shape comprises a leading edge defined at least in part by a first divine spiral, a tip defined at least in part by a second divine spiral, and a trailing edge defined at least in part by a third divine spiral.

20. The airfoil body of claim 19 wherein said planform shape further comprises a max trailing edge curvature defined at least in part by a fourth divine spiral.