Ad: **M-set hyperbolic components tuning the matter /dark matter /dark energy pie chart? Details (F.J. Culetto & W. Culetto 2016): Internal comments** (March 2017 and February 2018 update)

Conclusions rest on "not being walking the logical implication's ex-falso-quod-libet path". There is some toy-model character to our ideas/procedure. It is fair to state that a series of simplifications is made: e.g. neglect of $\Omega_{rad,\,0}$ and usage of infinite n-, k-limits though there could be finite k-limits to the bifurcation cascades. Inclusion of the radiation energy density would give corrections of approx. $-1\text{x}10^{-4}$ to $\Omega_{m,\,0}$ and $\Omega_{dm,\,0}$, while stopping the bifurcation cascade after n = 4 would diminish $\Omega_{dm,\,0}$ by approx. $5\text{x}10^{-3}$. Both corrections combined would eventually lead to 2nd and/or 3rd decimal place alterations of the $\Omega_{dm,\,0}$ - partitioning in the figure, the index 0 standing for zero redshift and un-partitioned. Some additional error may be due to the numerical integrations/lower and upper limit values in A_{com} - calculation. Our aim would be a schematic overview of potential $\Omega_{dm,\,0}$ - partitioning rather than special precision, the latter excluded anyway by the said simplifications. As far as the $A_2{}^0{}_{infl}$ - area formula is concerned, extrapolating from main cardioid generating circles' diameter $|a_{k=1}| = (|\mathbb{C}_2{}^1| - 1/4) = 1/2$ to the inf-k-limit and ending up with $(|\mathbb{C}_D| - 1/4)$ was pretty straightforward. Rewriting A. Einstein's on-shell condition $E^2 = p^2c^2 + m_0{}^2c^4$ by dividing by the pair mass-energy squared yields $(E/(2m_0c^2))^2 = (p/(2m_0c))^2 + 1/4$, which is of $z^2 + \mathbb{C}$ shape when complexified. Since one cannot get rid of dimensional quantities as is done with polynomial actions by insertion of dimensional coefficients, the $z_{n+1} = z_n{}^2 + \mathbb{C}$ iterative map forces the usage of relative, dimensionless variables and parameters. The big cardioid's cusp $\mathbb{C} = 1/4 + 0i$ thus seems to reflect/fulfil the on-shell condition. Looked at the other way around, M's universality, its structural and combinatorial features could well be the reason why Special Relativity is the way it is/could be when pushed to limits. Giving the right cosmological parameters according to a pie chart drawing mass-energy contributions to universe's whole content, our procedure via use of M-set's universality and hyperbolic component areas involving area-ratios had to implicitly know of $E = mc^2$.

As far as partitioning of the dark matter density parameter (& maybe of the dark energy parameter too) is concerned, there could be a connection to the set of the $\mathbb{C}$ parameters which give rise to an attracting fixed point for the $f_{\mathbb{C}}(z)=\mathbb{C}\exp(z)$ complex iterative map. And the boundary of the said set is a cardioid-like curve with cusp at (1/e + 0i) and left end at (–e + 0i) which, written in parametric form as a vector containing two univariant expressions is [exp(-x){x cos(SQRT(1-x^2))+SQRT(1-x^2)sin(SQRT(1-x^2))}, ±exp(-x){SQRT (1-x^2)cos(SQRT(1-x^2)) - x sin(SQRT(1-x^2))}] . A pretty good approximation to this curve with respect to its area is the true cardioid with $|a| = (e/2+1/4)$, yielding an area $A_{cardioid}$ of approx. 12.2 . From the ratio $2(A_{cardioid} - A_2{}^0{}_{infl})/(A_{c\text{-}disc} - 2A_{cardioid}) \approx 0.460$ one would then tentatively extract a further cosmological parameter-partitioning exceeding that of $\Omega_{dm,\,0} \approx 0.268$'s one by approx. 0.19 due to a *component of spinorial character* as would get being accounted for by doubly covering the corresponding areas. Ending up located well outside the dark matter's pie chart piece, the said component, if such, so had to be attributed to the dark energy slice still non-structured /un-partitioned.

An independent estimation of $\Omega_{de,\,0}$ would result from the $(A_{c\text{-disc}} - 2\pi c_D c_{GT} - 2A_2^0)/A_{c\text{-disc}}$ ratio, c_{GT} being the Großmann-Thomae band merging point's coordinate – 1.54368...+ 0i as part of the geometric mean radius SQRT($c_D c_{GT}$) of the said ratio's twice circle area. The $(A_{c\text{-disc}} - 2\pi(x_{\min\Gamma(x)})^2 - 2A_2^0)/A_{c\text{-disc}}$ ratio would give a $\Omega_{de,\,0} \approx 0.6861$, a value pretty well fitting its analogue gotten from $(1 - \Omega_{m,\,0} - \Omega_{dm,\,0}) \approx 0.6877$ in case of stopping the period doubling bifurcation series after n = 4. Both of the dark energy density parameter estimations are tentative ones, still lacking a logical explication /derivation. Recently we came across the simpler relation $\Omega_{de,\,0} \approx (A_{c\text{-disc}} - 3\pi(4 + c_D)^2/4)/A_{c\text{-disc}}$ (with the term $A_{c\text{-disc}}$ minus half the area of a cardioid with generating circle diameter a = I(4 + c_D)I in it) yielding 0.683 406. Since $A_{c\text{-disc}}$ is 16π, approximate $\Omega_{de,\,0} = 1 - 3(4 + c_D)^2/64$. As far as $\Omega_{dm,\,0}$ - partitioning by chaotic bands B_n is concerned, such is pretty likely if a continuous rotational symmetry is additionally present in the c-parameter plane. One could think of such a situation where there is a further unicritical map for a 2nd real axis, i.e. quasi-2D nonlinear dynamics. In the 1D-only situation there is no M's area being connected to B_n. And the hyperbolic M-components intermitting the chaotic c-region's axis segment would give rise to small corrections – not yet included in the A_{com}- calculations done – by their presence and by the corresponding "windows" in the chaotic veil slightly reducing A_{com}.

Concluding, there is a further source of corrections to $\Omega_{dm,\,0}$ and its partition: the possible distortions of M's hyperbolic components, especially of the low period-k ones although all of M's combinatorial features may be /stay preserved. And in the dark-matter-complexity context, there is no "dictionary" connecting the out there new particle content to partitions of $\Omega_{dm,\,0}$ yet. In the ordinary, stable matter case at least proton/neutron/electron belong to period $k=2^0$ oscillations. Thus in case of partitioning /k-sensitivity, more than one (stable) DM-particle or aggregate of such could get found linked to the same value-interval. Worse, the multiplicity of M's period-k hyperbolic components – which is 1 only in case of k=1 and k=2 – could be a source of further ambiguities. And a complete mystery is the partitioning-predominating, big Cantor- dust Julia set region, and what that could mean to the particle concept and interactions (without propagation of any action due to the entire lack of links in the set itself, but the set confined to a carrier-plane) in principle.

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