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Nuclear planetology is a new research field, tightly constrained by a coupled ^{187}Re-^{232}Th-^{238}U systematics, which by means of nuclear astrophysics aims also at understanding the thermal evolution of Earth-like planets after Mercury-like contraction and Fermi-pressure controlled gravitational collapse events towards the end of their cooling period [1]. In nuclear planetology, Earth-like planets are regarded as old (redshift z $>$15), down-cooled and differentiated black dwarfs (Fe-C BLD's), so-called interlopers from the Galactic bulge [1], which are subjected to endoergic ^{56}Fe(γ,α)^{52}Cr (etc.) reactions (photodisintegration), (γ,n) or (γ,p) and fusion reactions like ^{12}C(α,γ)^{16}O. It has recently been pointed out [1] that beside its surface temperature T$_{eff}$ of its outer core surface, the Earth shows also striking similarity in volume V (radius r_{Earth} $\approx$6.370 km) with an old white dwarf star (WD; r_{WD} $\approx$6.300 km) like WD0346+246. This major boundary condition for nuclear planetology can be described in terms of $V_{Earth} = V_{WD} = V_{const}$=4•$\pi$•$r^3$/3 ($r_{WD} \approx r_{Earth}$). However, in addition to the fact that Earth is habitable, the most obvious difference between a WD and the Earth is their density ρ (ρ=m/V; m mass, V volume): while a WD may contain $1M_O(M_O$= solar mass) per V_{const}, the mass of the Earth is only a tiny fraction of this, $\approx$3•10^{-6} M_O per V_{const}. Therefore, it is crucial to understand $\partial\rho$, or why m_{Earth}«m_{WD} for V_{const}. Here I argue that the application of principles constrained by the theory of relativity [2] may offer a possible answer to this question: it is generally accepted that mass is directly related to energy, E=m•c^2 (E energy; m mass; c velocity of light) or m=E/c^2. From $m\sim E$ we derive that any mass change can be described in terms of energy change [3]. Instead of ρ=m/V we may thus write ρ=E/c^2•V, and because of the special scenario $V_{Earth} = V_{WD} = V_{const}$ discussed here, the denominator of this equation becomes a constant term C=c^2•V_{const} =9.73•10^{37}m^{5}s^{-2}. From this it follows, that ρ=E/C, or ρ•C=E. Therefore, we arrive at $\rho \sim E$ for the WD/FeC-BLD case or, considering the evolution of the system over time t: $\partial\rho/\partial t\sim\partial E/\partial t$.Hence, concerning time integrated planetary evolution it may be concluded that any density change $\partial\rho$ of an old stellar remnant towards a $\approx$3•10^{-6} M_O habitable Earth-like planet is a measure for the system's energy change ∂E.

[1] Roller (2016), Geophys. Res. Abstr. **18**, EGU2016-291-3. [2] Einstein (1905), Annalen d. Physik, **18**, 639-641.