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Space Inside a Liquid Sphere Transforms into De Sitter Space by Hilbert Radius DMITRI RABOUNSKI, LARISSA BORISSOVA — Consider space inside a sphere of incompressible liquid, and space surrounding a mass-point. Metrics of the spaces were deduced in 1916 by Karl Schwarzschild. 1) Our calculation shows that a liquid sphere can be in the state of gravitational collapse ($g_{00} = 0$) only if its mass and radius are close to those of the Universe ($M = 8.7\times10^{55}$ g, $a = 1.3\times10^{28}$ cm). However if the same mass is presented as a mass-point, the radius of collapse r_g (Hilbert radius) is many orders lesser: $g_{00} = 0$ realizes in a mass-point's space by other conditions. 2) We considered a liquid sphere whose radius meets, formally, the Hilbert radius of a mass-point bearing the same mass: $a = r_g$, however the liquid sphere is not a collapser (see above). We show that in this case the metric of the liquid sphere's internal space can be represented as de Sitter's space metric, wherein $\lambda = 3/a^2 > 0$: physical vacuum (due to the λ-term) is the same as the field of an ideal liquid where $\rho_0 < 0$ and $p = -\rho_0 c^2 > 0$ (the mirror world liquid). The gravitational redshift inside the sphere is produced by the non-Newtonian force of repulsion (which is due to the λ-term, $\lambda = 3/a^2 > 0$); it is also calculated.

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