The interior of the Sun is much hotter than previously suspected

Traditional gravitational physics and Einstein's theory of relativity both describe the dynamics of cosmic objects, but in two different ways that are incompatible with each other. So far, there is no quantum description for General Relativity. Conversely, Quantum Mechanics is also only formulated without taking gravity into account. And Newtonian Gravitational Physics was of course also defined without quantisation. To illustrate the current, rather depressing situation of traditional research in the direction of a desired unification, I first quote here a few sentences from the [Research Report 2016](#) - Max Planck Institute for Gravitational Physics Quantum Gravity and Unification, by Nicolai Hermann from the department "Quantum Gravity and Unified Theories".

"Is there any evidence in the experimental data?
While quantum mechanics and GRT have been developed to explain observed phenomena (e.g. the spectral lines in atomic physics), nature gives us very few clues as to where to look for a theory of quantum gravity. A major obstacle here is that the magnitude of the expected effects is incredibly small. The relevant scale is the Planck length of about 10^{-33} cm; correspondingly, the relevant scale in terms of energy is about 10^{19} GeV, an incredible 15 orders of magnitude above the energy range accessible to the LHC. There is therefore no hope of ever directly measuring actual QG effects in the laboratory. However, one can speculate that QG may show up indirectly, for example in the cosmic background radiation or by providing a cogent explanation for inflation, dark energy and the origin of the Universe. However, one must be aware that such proposals cannot distinguish between very different approaches without doubt. For example, when such opposing designs as string theory and loop quantum gravity vie to explain the properties of the early Universe. ...

To sum up: All important questions remain unanswered so far, despite great efforts and numerous promising ideas. ... It remains a central challenge of physics to explain the structure of the low-energy world from the point of view of a Planck Scale theory."

The traditionally calculated force of gravity acting between two charged particles (e.g., between a positively charged proton and a negatively charged electron) is much smaller than the (also calculated) electromagnetic force between the same particles. And the difference is enormous. It amounts to 40 orders of magnitude. You have to know that 1000 times smaller means only 3 orders of magnitude difference, and a billion times smaller also means only 9 orders of magnitude).

The classically calculated difference between the gravitational force and the electromagnetic force is therefore really enormous. For this reason, in the "quantum world" of electrically charged particles, their gravitation has hardly been of any importance so far. In the world of cosmic bodies, on the other hand, the individual electric charges are almost always completely balanced (the negative with the positive), so that an electromagnetic effect, for example, between the Earth and our Moon is never calculated. Instead, only gravity has an effect in this case. Thus the classical way of thinking.

The most important discovery of the Universal Philosophy, based on my Unified Physics (*both defined and described on this Website; naturics.info*), is the quantisation of the entire Universe. The Unified Description of the Universe must therefore include not only the quantum properties of life, but also a kind of quantum cosmology, which includes the quantisation of cosmic objects. In our Unified Science we recognise only one universal interaction in all of Nature. That is the energy transfer between different quanta of our Universe. One could, purely theoretically, calculate a gradient of the transferred energy that would be equal to a (unitary or universal) force. However, no

additional information would be gained by this, so we leave these considerations aside. Instead, we do something much more important.

On an earlier diagram of the Unified Family of all possible physical quantities, I already made clear some years ago the connection between the universal values of these quantities and the values known from astrophysics for the Solar System.
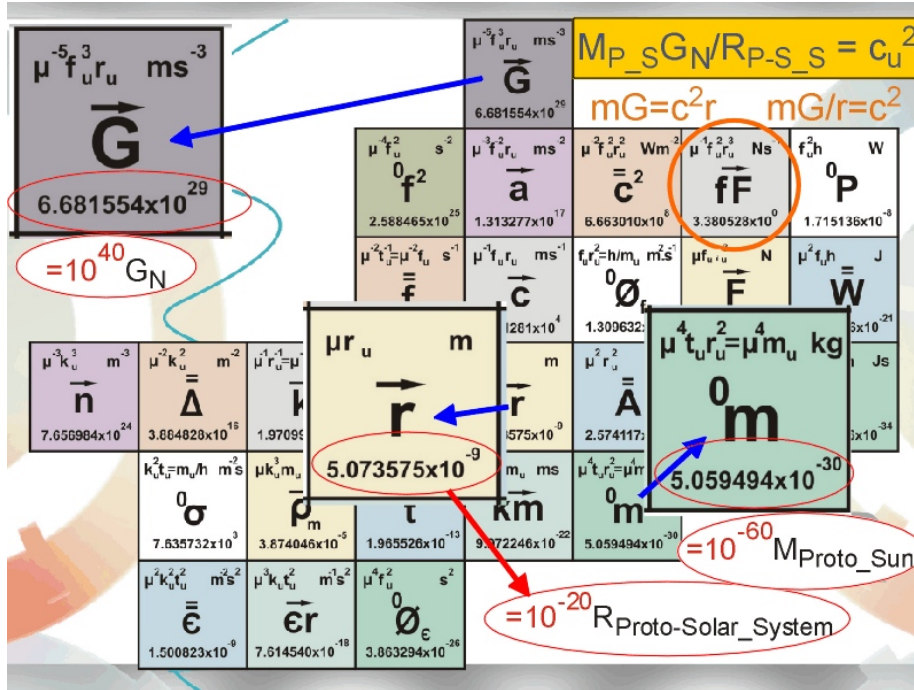
In the upper right corner of this diagram we see (on the yellow background) an equation used in astrophysics when one wants to calculate the velocities of the individual planets orbiting the Sun (in the traditional picture). It has been found that the mass of the Sun M_S multiplied by Newton's gravitational constant G_N and divided by the radius R_P of the planet's orbit equals the square of the planet's velocity (v_P): $M_S G_N / R_P = v_P^2$. In the red marks under the highlighted physical quantities we read, firstly, that the radius of the primordial Solar System (with the four primordial planets that accompanied the Proto-Sun) was 20 orders of magnitude larger than the universal "radius" of a quantum, r_u. Secondly, that the mass of the primordial Sun was 60 orders of magnitude greater than the universal mass of a quantum, m_u. And thirdly, that Newton's gravitational constant was (and still is) 40 orders of magnitude smaller than the universal physical quantity of gravity, G_u. So if we use this equation, as on the diagram, for the special case of the Proto-Solar System, we get as a solution on the right-hand side of the equation the square of the universal velocity c_u of the transfer of energy in the Universe:

$$(10^{-60}M_{P\text{-}S}) \times (10^{40}G_N)/(10^{-20}R_{P\text{-}SS}) = m_u G_u/r_u = c_u^2.$$

The interior of the Proto-Solar System was therefore not a vacuum from the beginning (in the sense of Einstein's vacuum speed of light). But the most important conclusion from this observation can only mean one thing: the study of the planetary motions in our Solar System reveals the universal quantum character of our Solar System. No one before me has ever claimed this. And probably not even suspected it.

If the Universe is quantised, not only on the smallest but also on the largest scales, then we must now take the last step and realise why all previous attempts to formulate a theory of Quantum Gravity have completely failed. If the mass of the Proto-Solar System, Newton's gravitational constant, and the extent of the Proto-Solar System (up to today's Asteroid Belt) are known and must be accepted as a fact in the upper equation, then we must also accept another variant of this equation as a fact:

$$(10^{-60}M_{P-S}) \times (10^{40}G_N) \times (10^{-20}R_{P-SS}) = 10^{-40}M_{P-S}G_NR_{P-SS} = m_uG_ur_u = P_u,$$

where P_u is the universal quantum power, but it is the same for all quanta of the Universe (which is emphasised on the diagram by the white background colour of this quantity). Consistently, we must also further read from the upper equation the information that the total power of the Proto-Solar System, P_{P-S} , was equal to the quantum power of 10^{40} quanta:

$$P_{P-S} = M_{P-S}G_NR_{P-SS} = 10^{40}m_uG_ur_u = 10^{40}P_u.$$

This was the actual result of the fact, that the mass of the cosmic "dust cloud", from which the Proto-Solar System formed, fixed all our physical constants (the universal values of all physical quantities) at once. One of these values is the value of the universal quantum power P_u = 17.15136 nW. This means that the total power of the primordial Solar System was $10^{40} \times 1.715 \times 10^{-8}$ W = 1.175×10^{32} W.

The magnitude of the radiation power of today's Sun (see Wikipedia) can be calculated from the solar constant (E_0 = 1361 W/m²), because this "constant" indicates the radiation power per square metre at the distance of the Earth from the Sun. The result is Φ = 3.828×10^{26} W.

Even if today's Sun has only about 40% of the mass of the Proto-Solar System, and part of the total power of that time must also be calculated on the planets, according to our upper calculation we must assume that the radiant power of today's Sun, which must be taken into account to estimate its central temperature, is about 4 orders of magnitude higher than the classical Φ value. According to the Stefan-Boltzmann law (see Wikipedia), this means that the innermost temperature of the Sun must be about 10 times higher than previously assumed, i.e. about 150 million Kelvin. This will force some theories of energy production in the Sun to rethink. The second reason is the speed of energy transfer corresponding to this temperature (classically called the speed of light). It is not the "Einsteinian" 300 thousand km/s but 16 million km/s. Every theory must take these facts into account if it is to have a chance of explaining the physics of nuclear reactions in the Sun to us.