UNIFIED CREATIVE PHYSICS

MODEL FROM ELEMENTARY PARTICLES TO GALAXIES

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1. FOREWORD

According to classical physical models[1] time passes continuously, spatial extensions are continuous, and temperature changes are continuous. Continuum mechanics[2], which is still popular today, is based on the continuous change of continuous fluid[3] and dimensions. This family of models also includes space-time theories[4] that consider space-time to be a continuum and illustrate the world with, for example, "stretchable rubber sheets, strings, or world lines[5]. ″

In this environment, quantum mechanics suddenly appeared, which teaches a completely different thing about the same world. It depicts the components in small, separate units, quanta. The relationship of these to each other, or to their environment, is also called quantization.

Quantization generally refers to the collision of particles with their environment, their repetitive motion, wave motion, and the repeated recording of discrete maximum-minimum values. we understand.

The peculiar situation has arisen that continuum mechanics does not perceive the quantizing effects of elementary components, and quantum mechanics cannot handle the combined effects of a set of components, which we experience at **the macro** scale. One might think that the models are well-divided in the physical arena and coexist peacefully, but this is not the case. Since A. Einstein[6], countless physicists have tried to develop a unifying theory, but we do not know of any breakthrough.

The failure of unification encourages the search for new common grounds, but it takes a very solid reason for someone to start waving a blank slate in front of a board full of formulas. [7] We are preparing for this!

We present a physical model that, instead of the dimensions of space and time and the space-time continuum produced from them, contains real quantities based on the kinetic energy of the quantizing elementary parts. It can be applied both at the quantum and macro scale.

It can be used to construct real, consistent energy balances. Most known physical quantities can be derived consistently from it.

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[1] https://wigner.hu/s/matolcsi/old/pdf/jegyzet/terido.pdf II. Introduction
[2] https://www.sciencedirect.com/topics/physics-and-astronomy/continuum-mechanics
[3] http://fizweb.elte.hu/download/Fizika-BSc/Folytonos-kozegek-mechanikaja/Jegyzet/folytkoz-emelt-tetelkidolgozas-2015.pdf
[4] https://real.mtak.hu/61988/1/EPA00011_iskolakultura_1998_02_038-046.pdf
[5] https://www.sciencedirect.com/topics/engineering/spacetime
[6] https://hu.wikipedia.org/wiki/Albert_Einstein
[7] https://quantumphysicsmadesimple.com/the-shut-up-and-calculate-interpretation-an-interpretation-of-quantum-mechanics/

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2. METHODOLOGY

According to the current mainstream, we derive additional physical quantities and create physical models based on the quantities of time, space, and temperature that are considered continuous, but we can now know about our world that continuity is just an outdated accessory.

In reality, more than 90 percent of our known universe[8] is made up of hydrogen and helium atoms, molecules, ions, and plasma, which move relative to each other, collide with each other, and bounce back. The moving particles transfer kinetic, or motion, energy to the neighboring particles they hit during the collision, and then bounce back, receiving motion energy.

After the collision, the total kinetic energy is the same as before the collision, and there is no free potential energy left at the collision site. Collisions must be perfectly elastic, otherwise the particles would have stopped moving long ago, and we would not exist in our present form.

The formation and interactions of subatomic particles are also quantized processes, so we will not highlight them here. Although interactions and transformations between atoms beyond quantization change the transfer of kinetic energy, quantized motion, also called thermal motion, or repetitive change, remains a characteristic of known material systems. Particles inherit kinetic energy through the mass-energy equivalence[9] [10] properly.

By mass we primarily mean a unit of matter that can be interpreted the same way both at rest and in motion relative to its environment. There are many ambiguous, macro-level definitions of mass, so we do not use the definitions of inertial mass, rest mass, or mole.

The kinetic energy of molecules, atoms, and other elementary particles is considered to be long-term, while the potential energy stored by elastic deformation during collisions is considered temporary or transient.

As we indicated in the introduction, the movement and collision of gas molecules and atoms, the wave motion, or the orbit of celestial bodies, the repetitive movement of elementary parts, the repeated recording of discrete maximum-minimum values, We call it quantization. The most well-known, tangible cases of quantization are, for example, the bouncing of a ping-pong ball, the movement of a pendulum, or the production of sound.

It does not make our job easier that the theoretical and applied disciplines of physics, and their further branches, have been hindering the development of a unified physical approach for more than a century. What is accepted in quantum theories is mostly not usable in continuum mechanics, and vice versa. Thermodynamics and fluid mechanics cannot interpret many physical phenomena in the same way either.

Wave theory and particle theory only touch on a few points, but their models mostly exclude the other interpretation. The transition between the subfields is ensured only by numerical methods and limited empirical correlations, but these do not constitute a common theoretical basis.

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[8] https://www.sciencetimes.com/articles/11524/20170403/hydrogen-is-the-most-common-element-heres-the-reason-why.html
[9] https://plato.stanford.edu/entries/equivME/
[10] https://hu.wikipedia.org/wiki/T%C3%B6meg-energia_equivalencia

It's funny that the great scientists of quantum mechanics, famous for their practicality, explained macro-scale effects with mystical quantum entanglements, conjectures, and mystical quantum friction. Schrödinger's paradox also tries to transfer quantum phenomena to the macro world, with quite debatable results.

If we calculate velocity, acceleration, mass, kinetic and potential energy from the dimensions of space and time, then we ignore the effects resulting from the quantization of the constituent elements, which are hidden by the principle of continuity. This means that our calculations do not reflect reality. We correct the differences with empirical factors, constants, and complicated procedures, but this only means a numerical and not a theoretical correction.

If we calculate the dimensions of time and space based on the speed, acceleration, mass, kinetic and potential energy experienced in our models at the macro scale, it turns out that transformations and mathematical tricks are needed to restore a model that corresponds to reality.

We have reduced the dimensions of time and space to a continuum in an environment built from quantizing elements. We have performed operations with them, and then, calculating backwards, we are surprised that we have to tinker with the results to make them closer to reality? It is not relativity or spacetime that is playing tricks on us, but our superficial knowledge.

It seems that the correction required by the reduction should not be carried out by introducing relativistic quantities, but by restoring the information that was lost or deformed during the declaration of continuity. Anyone who dreams of continuity in a world of quantizing elements can only operate with an endless series of mathematical tricks and increasingly complex theories.

In our opinion, there is something missing from previous physical models, and that is quantization information. This is not a mathematical quantity written on a piece of paper or packed into bits, but quantization information that has a real effect on physical processes. We will prove that the mass-energy-information model holds up at both the quantum and macro scales.

3. INFORMATION LINES

The *information* In the expression, the ***formation*** element refers to the fact that there is a carrier in the background whose formation is not random, but carries and conveys some order, organizing principle, or effect for those who come after, the present and the future.

Information lines, or information propagation paths, are used to illustrate inherited and transmitted information. **We start from the well-known fact that our known material world is made up of colliding, orbiting, accelerating, decelerating elementary particles, atoms, molecules, bodies, and celestial bodies, moving, changing, and** (in-) **forming.**

A ping-pong ball dropped on a table is quantized as it bounces, or a planet is quantized as it orbits its star periodically. Each quantization typically occurs independently of the others, but the effects of each quantization on the environment are combined. Quantizations do not add up like apples in a basket, because they do not occur at the same time or in the same place, but they can still affect each other through the transfer of information and kinetic energy.

In contrast, the popular physical system called continuum mechanics cannot handle the interaction of the constituent elements resulting from the quantized motion of the elements. It takes inventory of the constituent elements like apples in a basket. During possible transformations, it views the constituent elements as a randomly located set, a fluid, of equivalent parts, as if the same thing were happening to each element in the same place, at the same time.

It attributes pressure, temperature, density, and specific heat to the space-filling fluid. The parts are just *independent* statistical elements. Information is just a footnote in the measurement protocol. If we do not understand the connections of reality, but we experience its phenomena, then data collection, hypothesis building, and mathematical models can come into play.

Continuum mechanics calculates measurable physical effects, phenomena, and empirical factors approximately without revealing the actual relationships.

The debate about the theoretical foundations has been going on for 200 years, which proves that some fundamental or crucial information is still missing from the discourse.

In contrast, collisions of molecules and atoms, or their quantizations, carry information that can be decisive. For example, two nitrogen molecules in ambient air at 20 °C, near the Earth's surface, moving at an average speed of nearly 500 m/s, collide elastically, then bounce back and collide again with other molecules. The mean free path between collisions is $6 * 10^{-8}$ m. Based on this, the average molecule participates in $500/(6* 10^{-8}) = 8.3 * 10^{9}$ collisions per second, which is also called thermal motion. [11] [12].

In reality, the components, i.e. atoms and molecules, cannot be frozen in a snapshot because they move with kinetic energy relative to their environment, collide with each other at different places and times, and these interactions can only be represented as a process of change.

In a given material formation, a given molecule does not collide with just any molecule, but with the one that falls in its path. Which one falls in its path? This is determined by the preceding collisions.

[11]Mean Free Path, Molecular Collisions, Hyperphysics.phy-astr.gsu.edu. Retrieved 2011-11-08.
[12]Bohátka S. and Langer G. (2012) Vacuum technology, atomki.hu A-M1 1-2-3.pdf 15.p

This is no coincidence, because it also had an exact antecedent – and so on until the beginning. Since the collisions do not occur at the same time, the frequency of the collisions, and the change in the frequency, are also determinants of the resulting measurable effect on the environment.

In the quantization basic case, a molecule moving with kinetic energy collides elastically with its environment. (see *Figure 1*) This process creates a kinetic effect that can be consistently described and calculated using the tools of point mechanics (for example, Newton's laws) in the given situation, which we call **the creative layer**. At the creative layer, we cannot yet know what the effect will be like at the macro layer. (By macro we mean the size that includes a multitude of atoms.) The relationship and circumstances of the previous and current collisions are carried by the **information about quantization**. The macro-level kinetic effect that affects the environment can only be interpreted by taking into account the quantization information.

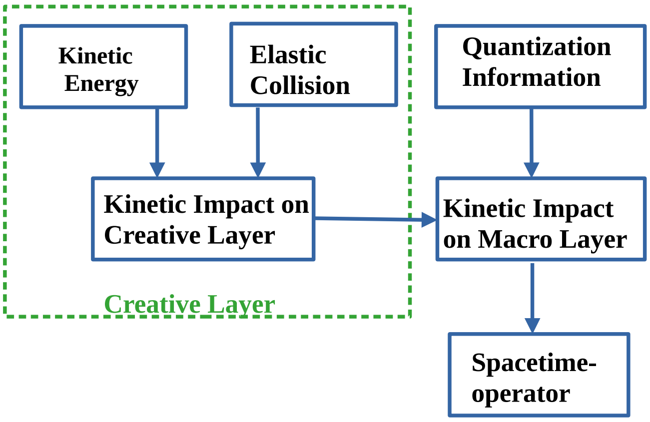

Fig. 1, Quantization process

The quantization information includes the frequency of collisions, the change in frequency, and the length of the collision process compared to free motion. The effect that appears towards the environment is called **the spacetime-operator**. This already inseparably includes the creative layer kinetic effect and the quantization information.

If the average kinetic energy of moving and colliding (quantizing) molecules in a given air space is not changed, but the average free collision distance between the molecules is reduced, then this change in quantization information, which does not carry a direct change in kinetic energy, still causes a pressure change at the macro level. This is nothing more than a change in the potential energy appearing towards the environment.

The excess energy released to the environment did not arise from nothing, but is the consequence of a change in quantization, which is carried by a change in quantization information.

A bouncing molecule with the same mass and kinetic energy exerts greater pressure on the surface of a pressure gauge the more often it collides.

Quantization information is an integral part of the environmental, macro-level energy balance. In systems containing quantizing elements, we cannot speak of independent matter, energy, or information.

The quantization information is contained in the material itself and transmitted during a process, from discrete event to event.

Our entire known world can be strung together on this fundamental information line, because there is no existing matter, energy, or structure that is independent of it.

Everything that bounces, collides, orbits, radiates, attracts and repels, that is, the entire known universe, contains, combines and transmits quantization information. The existence of Planckian electromagnetic radiation is also evidence of universally present quantization, which includes both the periodic variation of the electromagnetic field and the repetitive motion of components with mass. We do not know of any subatomic, elementary particle that does not quantize or collide.

Quantization information organically and consistently connects the phenomena and elements of quantum mechanics to the macro world, without the need for mathematical transformations, conjectures, or mystical tricks.[13] [14] [15]is not necessary.

In our opinion, the quantum entanglements that are considered mysterious[16] [17] [18]behind it is the consistent presence of quantization information.

A quantizing particle " *does not remember* ", but the quantization information *"does not forget"* .

The sub-elements, atoms, and molecules have collided before and hopefully will again in the future, so they carry information about their environment and transmit exponentially spreading information to their environment.

The propagation rate (speed) of the effect and information transmitted through collisions is the same as the rate (speed) of the transfer (collision) of the kinetic energy of the components and molecules. If we consider only the ambient air, then according to the calculations made earlier, a nitrogen or oxygen molecule participates in an average of $8.3 * 10^{9}$ collisions in 1 second. Between the $2.45 * 10^{25}$ molecules in a cubic meter of ambient air at 20 °C, nearly $1 * 10^{35}$ collisions occur in one second if two molecules produce a collision with each other. (The 1 is followed by 35 zeros.)

Suppose we have enclosed one cubic meter of ambient air in a container. In this, all molecules are free to move or collide. The collision involves a transfer/reception of kinetic energy and a combination of information, as shown *in Figure 1.*

These collisions combine to act on their surroundings and, in our example, on the walls of the container. They push the walls with an average force of 10 N per square centimeter, which comes from molecular collisions, we say, without being able to consistently derive the transformation of the kinetic (motion) energy of the molecules into potential (pressure) energy.

The calculations are about random molecular thermal motion and average force, but these are not material quantities. Molecules occasionally colliding with a wall, as described by quantization information, are not equivalent to a force concentrated at a single measurement instant, averaged over time and space. We use the possible numerical agreement in our models, but we can only calculate the conservation of energy statistically in traditional physical models after the fact and with empirical data.

None of the gas pressure, temperature and specific heat carry primary information. They are fictitious numerical values that more or less approximate real quantities. We cannot tell from them how we

[13]https://fizipedia.bme.hu/index.php/Kvantummechanika
[14]https://scholar.harvard.edu/files/david-morin/files/waves_quantum.pdf
[15]https://en.wikipedia.org/wiki/Erwin_Schr%C3%B6dinger
[16]https://hu.wikipedia.org/wiki/Kvantum-%C3%B6sszefon%C3%B3d%C3%A1s
[17]https://hu.wikipedia.org/wiki/Koppenh%C3%A1gai_interpret%C3%A1ci%C3%B3
[18]https://en.wikipedia.org/wiki/Copenhagen_interpretation

arrived at the specific snapshot, so they can only be virtually linked to previous events. We cover this contradiction with the concept of *chance* , which means nothing more than " *we do not know why now and why there* ".

There are scientists who introduce information into our material system as an existing characteristic, but so far they have not been able to organically link it to the mass-energy system.[19][20]. The information carried by the concepts of disorder and entropy is also not related to the formation process of the actual quantizing elements. It is also a mistake to consider entropy, which is the basis of thermodynamics, as continuous because of general quantization.

The quantization information somehow, at some point – initially – entered the material system and we inherited it. Mass and energy somehow relate to their environment, the outward effect of which is not fully determined (deterministically) by the presence of mass and energy. Information cannot be grasped, but its carriers can. **Information transfer is a process containing quantization elements that spreads unstoppably as long as matter exists.**

The information associated with the presence of matter and/or energy not only connects individual phenomena or events to each other, but also to a process. **Information acts separately from mass and energy, but the result inseparably transmits mass, energy and information** as the future starting point of a subsequent event, where the combination of the carried information and the information received from the environment creates a new result, which as part of the process has a new effect on the environment and carries the combined information further.

It is not energy that is inherited separately into energy, nor is information that is inherited separately into information, but rather the mass-energy-information system is formed under the influence of the received/absorbed information.

[19] https://www.google.hu/books/edition/In_the_Beginning_Was_Information/nHuR3_9V03IC?hl=hu&gbpv=1&dq=inauthor:%22Werner+Gitt%22&printsec=frontcover

[20] https://www.academia.edu/6147414/Entropy_a_guide_for_the_perplexed?email_work_card=view-paper

4. REPETITIVE BOUNCING

Figure *2* , we present an experiment that anyone can easily repeat. Many of us have experienced that a ping-pong ball dropped on a table bounces with increasing frequency until it stops completely. The ball moves slower due to losses. We analyze this process using a data logger and a piezoelectric force gauge.

A ping-pong ball is dropped from a height of 80 mm onto the force sensor-equipped plate, released at the upper stop. The four vertical guide rods ensure the vertical movement of the ball. The bounce occurs with decreasing amplitude, bouncing back from the force sensor surface until the bounce stops due to losses. This process takes place in 1.8 s for the ball dropped from a height of h = 80 mm. The piezoelectric (dynamic) force sensor is fixed on the lower stop, the electrical signal of which is processed by a PC via a data logger.

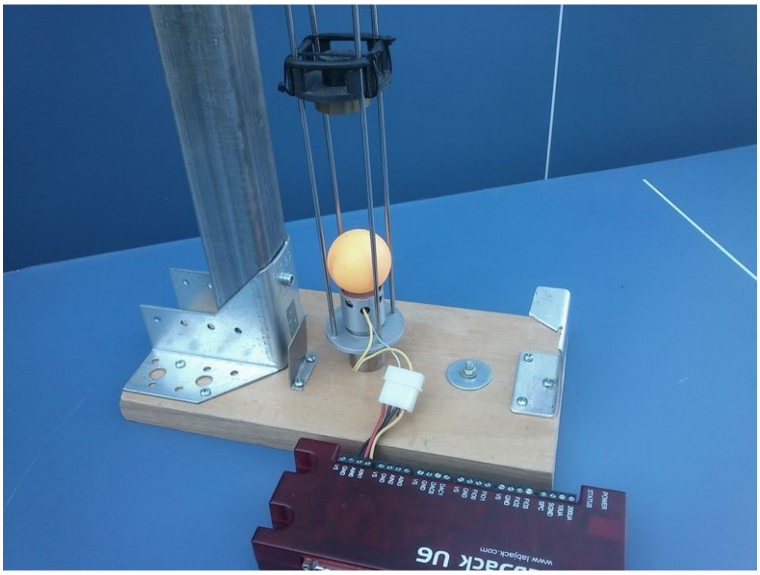

Fig. 2. Ping-pong Test

Figure *3* shows the voltage signal proportional to the force as a function of elapsed time. The positive values above the time axis show the deceleration force of the impactor on the ball, the negative values below the axis show the acceleration force of the rebound as a function of elapsed time. Based on the maximum speed of the ping-pong ball with a mass of $m = 2.8$ g, $v = 1.26$ m/s according to the energy conservation equation $mgh = 1/2mv^2$ and the duration of the collision process $t = 0.0004$ s, the average value of the deceleration force of the first collision $F = 8.82$ N is calculated using the momentum conservation equation $Ft = mv$.

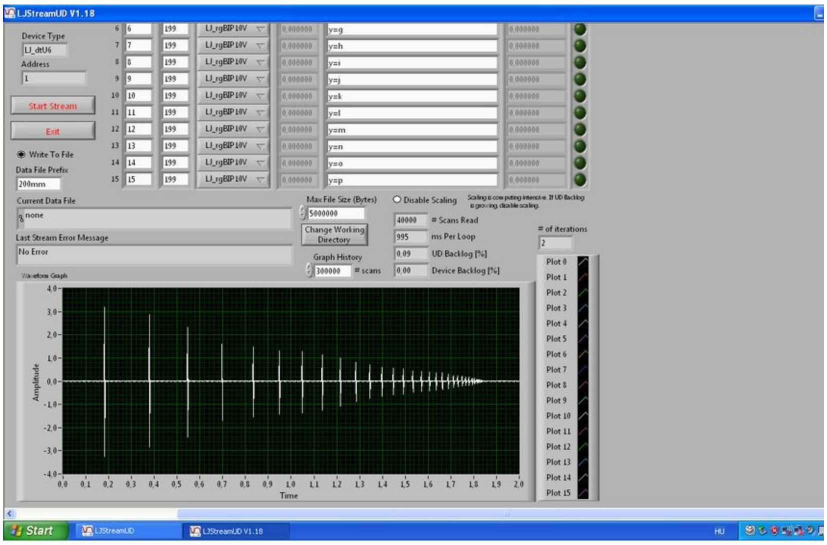

Fig. 3. Force-time function with 80mm drop

The maximum impact force $F^* = 1.414F = 12.5$ N *is equivalent to the amplitude of 3.2 V in Figures 3 and 4* due to the nearly sinusoidal waveform.

The collisions shown *in Figure 3* follow each other with smaller and smaller amplitudes and shorter pauses, as the ball has less and less kinetic energy after the bounces. The initial period time has decreased to a 30th after 1.4 s, meaning that the ball bounced 30 times more often at the end than at the beginning. Figure *4* shows the enlarged force-time function for the first impact after the 80 mm drop. The other curves have a similar course, only with a smaller amplitude.

Results:

The magnitude of the deceleration impulse delivered by the ball is obtained by integrating the positive part of the time function of the force over time. The integral of the negative part of the function gives the returned acceleration impulse. The difference between the two is the deformation loss. In the table below, two equal parts are cut out from the bounce duration of the 80 mm drop. The first section begins at 0.08775 s. The magnitude of the impulse series (momentum) delivered by the ball to the sensor during each period is calculated by numerical integration over the section based on the samples taken.

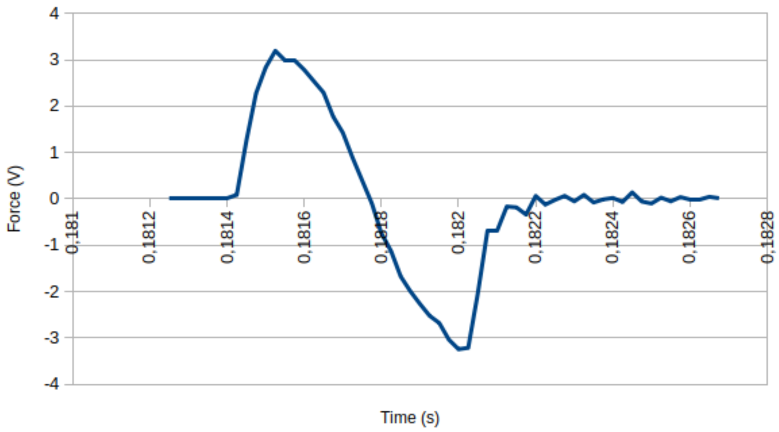

Fig.4. Force-time function after 80 mm drop

Time period:	0.08775 – 0.79375 seconds	0.794 – 1.500 seconds
Pulse train integral (Ns)	243	244

The two equal periods of $t=0.706\ s$ (within 0.5% error) produced equal pulse train integrals, despite the fact that the ball's maximum impact force decreased from the initial 12.5 N to 2.23 N. The corresponding kinetic energy loss ratio was $12.5^2/2.23^2=31.4$, which was caused by air resistance and deformation losses together. If this study had been performed with a sensor suitable for measuring static force, we could have measured the potential energy accumulated during the impacts, which measurement would have given the same result due to the conservation of energy.

While the ball is bouncing, it must receive impulses from its surroundings in the collision process whose time integral is sufficient for the ascent against gravity. The only open question was whether the integral of the impulse series changes during this process. The kinetic energy decreased significantly, while the pressure exerted on the surroundings, i.e. the impulse summed/integrated over time, did not change.

Part of the kinetic energy from the drop was used for air resistance and deformation losses, which were released into the environment, but the remaining kinetic energy of the rebounded ball, due to the accelerating bounce, continued to exert an unchanged static pressure on the impactor, which is also part of the environment. Static pressure corresponds to the potential energy measured towards the environment, which did not decrease during the decelerating movement, but became more frequent during the bounce. The displacement of the pressed surface in the direction of pressure represents work. Finally, it is also worth answering the question of whether the static pressure, potential energy, kinetic energy and momentum integral can form a consistent physical system.

What exactly happens during a collision? The ball with a mass of m=2.8 g collides with the 380 g force gauge impact plate at a speed of v=1.26 m/s, possessing kinetic energy $E=1/2mv^2$ =0.0022 J. During the collision, the shell structure of the ball is compressed like a spring. The potential energy stored in the spring, which has undergone deformation s under the influence of the force F, is $E=1/2Fs$, which is converted back into kinetic energy when the spring is released – reduced by losses. (The relative displacement of the impact plate is also classified as deformation losses.)

The force accompanying the release of kinetic energy of the impacting ball pushes the impactor, which push can be examined by another kinetic method. This method is based on the principle of conservation of momentum or impulse. The momentum of the ball is understood as the relation $P=mv$ where v is the speed of movement. The impulse exerted by the ball is $P=Ft$=0.0035 kgm/s, *where* F is the average force and t is the time of action.

In an elastic collision process, the sum of the kinetic and potential energies is constant. No matter how fast or slow the transformation occurs, the end result is always the same. This is why we chose kinetic energy as the basic quantity in our investigation.

The average force acting continuously on a unit surface is called pressure (static pressure in a flowing fluid). A surface moving under pressure does work towards its surroundings, therefore pressure is considered potential energy. (energy = ability to do work) The average force can be calculated by the time integral of the force function and the integration time quotient. The time integral of the force is exactly the same as the impulse acting on the surface, or impulse series. The unit of measurement of the compressive force of pressure is (*N*). The unit of measurement of impulse is (*kgm/s*), or (*Ns*). If the integration of the impulse series (collision of gas molecules) is performed for exactly 1 s, then the magnitude of the impulse with a numerical value of X (*Ns*) will also be a force with a numerical value of X (*N*). This is the compressive force of pressure.

Our problem statement is also supported by the literature[21], but placing the diagram of Figure 2 used there in the *"energy-impulse space"* does not solve the quantization problems.

We repeated our measurement with different drop distances and integration lengths and obtained the same result.

In general: if a bouncing ball with kinetic energy reduced by braking by the environment exerts the same cumulative effect (impulse sequence, pressure, acceleration) on its environment as it did before the kinetic energy was removed, then it follows that the energy transferred to the environment by friction between individual collision events and the potential energy provided to the environment by the entire impulse sequence are not additive (subtractable) quantities.

We have a ball moving slowly, whose kinetic energy also decreases, but the potential energy it exerts towards its surroundings (collision) remains unchanged. This result proves that there must be something else in the system that has a decisive influence on the energy balance.

This influence is called information (in-formation). The key to a consistent description of the bounce is the quantization information, which in this case is the change in the bounce frequency.

[21] https://fizikaiszemle/archivum/fsz1102/bokor1102.html Figure 2.

As we wrote earlier, repetitive movements and changes are called quantization[22], when each constituent element acts alternately between a minimum and a maximum value.

Based on the above, it can be seen that the static pressure, or potential energy, created by the quantization and collision of mass points towards the environment cannot be determined by the kinetic energy of the colliding element, because the determinant integrates the impulse series, which is not measured in energy units.

We stated earlier that according to the conservation of energy theorem, the kinetic energy of the mass points before and after the ideal collision has not changed, but we must add to this that the macro potential energy, which varies as a function of the quantization information, cannot be left out of the balance either. If this energy did not arise "*from nothing*", but rather by satisfying the first law of thermodynamics, then we must confirm that the quantization information has energy, and its effect must be included in the energy balance.

In contrast, the usual thermodynamic explanation: The bouncing ball loses energy through external and internal friction, which is converted into heat ($Q = C_p mdT$) and is released into the environment. When the kinetic energy ($mgh = 1/2mv^2$) created from the potential energy is completely converted into heat, the bouncing stops. The critical element of these calculations is the determination of the specific heat C_p and the temperature change dT at constant pressure. In this explanation, the frequency of the bounce is not significant. There is no consistent theory for the decay of the static pressure accompanying the bounce. This deficiency, in the case of energy conversion processes taking place in flowing fluid, can be partially compensated for by algorithms loaded with complex empirical elements.

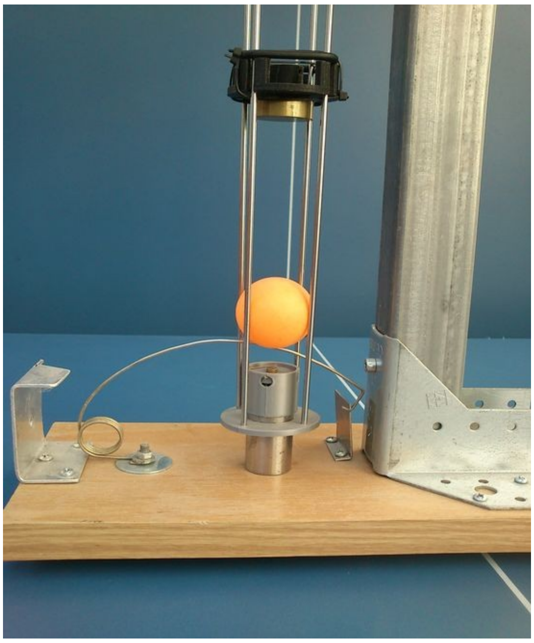

Fig.5. Launch by spring

The above experimental setup is modified by not creating the movement of the ball by free fall, but by the acceleration force that occurs when a prestressed spring is released. (see: *Figure 5.*) After being launched, the ping-pong ball bounces between the lower and upper stops until it slows down so much that it no longer reaches the upper stop. From then it produces a movement similar to that of the previous free fall version.

With our current experiment, we are looking for the answer to the question of how much pulse sequence a ball fired with the same initial velocity, i.e. the same kinetic energy, will produce when bouncing in gaps of different sizes during the examined integration time of 0.25 s.

Numerical integration results:

Bounce gap size:	100mm	160mm
Pulse train integral (Ns)	573	367

[22] https://hu.wikipedia.org/wiki/Kvant%C3%A1l%C3%A1s_(physics)

It can be stated that the ball bouncing with the same initial velocity in the narrower gap – as expected – creates a larger impulse integral towards the environment.

The integral of the impulse series is also proportional to the force exerted on the environment (per unit area), which can also be called static pressure. The exerted force, or pressure, represents potential energy, which can do work towards the environment by moving the compressed space.

We mention that the literature also uses the kinetic energy of gas molecules to describe the pressure created by a set of molecules. For example, in the chapter of the interpretation of pressure in kinetic gas theory, Dr. Árpád Veress's textbook on Heat and Flow (Hő- és áramlástan) I [23], he refers to the relationship formulated by R. Clausius, according to which " *the pressure of a gas can be calculated as the sum of the kinetic energy calculated from the motion of the molecules in a unit volume"*.

This theoretical definition, which seems plausible, is not a problem until we want to add up the kinetic energy of the molecules. The molecules can move in all directions in space and occasionally collide elastically. We usually refer to pressure per unit area, against which the gas molecules occasionally collide and bounce back. By pressure we mean the average force exerted on a unit area, which is a quantity often used in kinetics.

Averaging or summation is also " *difficult"* because not all molecules collide with the wall at the same time (not even for the purpose of measuring pressure), so the sum of the molecular kinetic energies cited above is not enough by itself to determine the effect on the environment, i.e. the pressure.

We could also say that the hidden part of the kinetic energy is the stored heat, but thermodynamics cannot give the absolute magnitude of the heat, it only calculates its change numerically as the product of the empirical specific heat, the temperature difference and the rest mass, if heat is released. Without heat exchange or temperature change, the kinetic energy remaining in the gas fluid remains hidden to thermodynamics.

Another problem is how long we count and wait for the molecules to collide with the measuring surface to sum up their kinetic energy. A molecule can collide multiple times or not at all. The kinetic energy decreases during the collision process (sometimes to zero) and then increases again. What impact does this energy conversion process have on the environment?

If the molecules are closer together, i.e. the mean free collision distance is smaller, then collisions occur more frequently even if their kinetic energy calculated from their *"forward motion"* does not change or may decrease. More frequent collisions mean a greater cumulative force, a greater pressure during a given sampling period.

Based on our ping-pong ball experiment above, we can see that R. Clausius's statement quoted above cannot be interpreted without knowing the collision frequency of molecules.

We have seen that the effect of all the kinetic energy of the molecules never appears on the pressure measuring surface at once, so only a small part of it creates the (static) pressure. The small part is given by the ratio of the molecules that are currently colliding to the molecules that are freely moving.

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[23] Dr. Árpád Veress, Thermodynamics and Flow I. Thermodynamics Part 1, BMEKORHA104, BME, 2019.02.04. P17-18.

In contrast, the time integral of the collision impulse series is proportional to the pressure, which implies that kinetic energy and collision impulse are not alternative or mutually derivable quantities, despite the fact that a significant part of the literature based on the continuity principle erroneously derives the other from one by simple summation.

Based on our repeatable and reproducible experiments, it can be stated that the change in the frequency of quantizing events, i.e. the inclusion of quantization information, enables the consistent determination of the energy transferred to or received from the environment, or the work done.

Quantization information is an integral part of the environmental, macro energy balance.

In systems containing quantizing elements, we cannot speak of independent mass, energy, or information.

The quantization information is contained in the matter itself and is transmitted in a process, from discrete event to event. We can also say that after a bouncing ball or a gas molecule participating in a series of collisions, we do not know what cumulative effect (pressure, work, acceleration...) it has on its environment until the next collisions occur.

The material and energy systems that we can observe and manipulate and their components cannot be examined independently and without knowledge of the antecedents, because the processes of quantizing events are information that is decisively built into the preceding events, and external, manipulative information together create the continuation.

A material process cannot exist without embedded information, as the effect of matter and/or energy on its environment, its potential or kinetic energy, is determined by the embedded information.

Looking at the results of our ping-pong ball experiment, we can say that quantization information can change the complex, macro energy balance by “ *reorganizing the hammering”* through more frequent or less frequent quantization.

5. SPACETIME MODELS

" *Spacetime in physics* **is** *a mathematical model that unifies space and time in a manifold , describing the structure of the Universe .* "[24] [25]

Birth of spacetime models[26] [27] can be traced back to the realization that the dimensions of space and time are not suitable for describing all phenomena.

If the space-time continuum were applicable to quantizing elements, or to the quantum world, then it would have to include the energy transformation and quantization processes that characterize our world in general. We do not find any trace of this in the world models that can be divided into parts by individual events, event lines, and event horizons. It seems that mass quantization fails in space-time models based on continuity.

If individual points or sections of our space-time model correspond to individual events, where does their relationship to each other, or the built-in quantization information, appear [28]?

If the space-time continuum were the real thing, and not separate space and time dimensions, then the question must be answered as to what mathematical procedure is capable of creating the real from the virtual.

Another formal problem is that space and time are not independent variables due to the dynamical properties of the motion process, so their common differential-value could not be a consistent quantity either. For example, we associate the speed of motion and the acceleration, which are time-dependent variables, with the space dimensions. In order to establish a consistent differential equation, the individual dimensions/variables would have to be independent of each other.

If the derivation of time is not realistic, then we need to introduce corrections to achieve results that can be validated in practice. This is what constants and numerical methods are for. There are plenty of databases, tables, and design aids. Numerical methods work…

If a force acts on something, it also reacts with a counterforce that affects its surroundings. We don't usually talk about where we calculate motion and speed from. A theoretical point in space cannot exert a force. We use the accelerating frame of reference[29], for this but its designation is arbitrary. The force accelerates in one direction, but the reaction force also pushes its surroundings back - like a rifle being kicked back. Nothing stays where it was before. Where does the zero point of the frame of reference go in this case?

In our view, continuum-based relativistic spacetime theories deviate from measurable reality to such an extent that we cannot use them as a basis for formulating our consistent theory. We need a different definition of spacetime if we are to treat quantities and changes as actual physical phenomena.

Time, length, and temperature did it 100 years ago as basic quantities, but sciences fueled by quantization are tearing apart the scientific superstructure built on continuity principles.

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[24] https://hu.wikipedia.org/wiki/T%C3%A9rid%C5%91
[25] https://wigner.hu/s/matolcsi/old/pdf/niecet/terido.pdf
[26] https://fizipedia.bme.hu/index.php/Speci%C3%A1lis_relativit%C3%A1selm%C3%A9let
[27] https://www.sciencedirect.com/topics/engineering/spacetime
[28] https://wigner.hu/s/matolcsi/old/pdf/niecet/terido.pdf
[29] http://theorphys.elte.hu/~drotos/Faem/Gyorsulo.pdf

6. CONSISTENT SPACETIME

The space-time continuum definition presented in the previous chapter is not compatible with the system of quantum mechanics, so something had to be done! Countless theories have appeared that try to bring the contradictory positions to a common denominator with some theory related to time or space-time[30]. Such theories include: the introduction of information bits, the expanding or inflating Universe, extra dimensions, time dilation, Doppler Shift, quantum entanglement, field equations, uncertainty relations, space-time curvature, cosmological constant, metric tensor description. Although these shed light on a narrow area, they do not help with the fundamental deficiency that placing quantization events in space-time necessitates a new model.

A debate that is still open today about the realism or non-realism of quantum theory began in 1925. W. Heisenberg and later E. Schrödinger abandoned the pursuit of reality in quantum theory, and the non-realist position prevailed, which was also adopted by N. Bohr, in contrast to A. Einstein[31], who insisted on realism. J. Bell's correlation experiments on the inequality problem and their repetition in our time did not end the debate either.

We could also jokingly say that it is not realistic to prove a non-real quantum theory with a realistic test. The representation of the relativistic " *space-time continuum"* does not seem to be solved either, because the well model and string theories are spectacular, but the time dependence is doubly present in them, so we do not consider them to be consistent models[32]. This additivity error is also true for events described with Minkowski space[33]. See the interpretation of the 4th dimension: $X4=(-1)^{0.5}\ ct$.

According to A. Fine, the leading figures of quantum physics (Solvay Conference 1927) almost ostracized A. Einstein so that his realist stance would not hinder physicists from spreading the " *working* " quantum theory. *"They were particularly afraid that Einstein's realism would lead the next generation of the most excellent students into a scientific dead end."* In light of the above quote, this case is a typical example of *the "end justifies the means"* fraud. Here, we are not only talking about theories, but also about individuals, in other words, this is a power game that brings to mind the case of Galileo Galilei.

In the Lorentz transformation, H. Lorentz " *establishes a connection between two inertial systems that perform uniform rectilinear motion in the X direction relative to each other. The mutual motion occurs along the X axis at a velocity v* ". According to the derivation, separate events occur in the two inertial systems. It is no coincidence that H. Lorentz[34] - according to the author of the article - " *could not interpret"* the two types of system time.

Mass of parts " *flow* " and interact with each other due to the expansion of the known universe. If we assemble cosmic matter and energies and the "*grand system "* from locally determined field equations without thoroughly clarifying the interactions between them, we end up in a situation like A. Einstein's

[30] real.mtak.hu/61988/1/EPA00011_iskolakultura_1998_02_038-046.pdf
[31] Arthur Fine, The Instinctive Ontological View, www.tankonytar.hu/hu/taralom/tamop425/2011_0001_537_Tudomanyfilozofia/ch28.html
[32] Kornél Sailer, Introduction to Quantum Mechanics, University of Debrecen, Faculty of Physics, Debrecen 2002-2008. P.30.
[33] A.Einstein, Special and General Relativity, Gondolat Budapest, 1973. P.33
[34] https://hu.wikipedia.org/wiki/Lorentz-transformation

with the cosmological constant of the general theory of relativity[35] , which changes from time to time due to new discoveries. A. Einstein later called[36] the cosmological constant the biggest mistake of his life. We could also say that the cosmological constant was given a gap-filling role, and it is currently playing that role in the ever-narrowing, but still significant gap.

There are several thought experiments describing the principle of relativity that treat the properties of inertial mass too loosely. One such example is that it is impossible to decide which of two astronauts facing each other in space is rotating and which is stationary, because each sees the other rotating.

In this example of relativity, the separation of dependencies has taken its toll, because astronauts cannot end up in empty space. The one that is spinning is rotated by its environment through an energy transfer process, of which the other astronaut is also a part, so the energy state of the two astronauts relative to their environment is not equivalent. The molecules of the astronaut that is spinning are affected by a different centrifugal force than those of the non-spinner, or in other words, the spinning one. If the astronaut spins too fast, his body may even break apart under the influence of dynamic/inertial forces, while the other one may remain intact. " *The one who spins better has a longer neck."*

Our model overcomes these problems because the transfer of kinetic energy and quantization information associated with quantization events places the process of change in real space. This process has a natural connection to physical space and the formation of events.

Information-driven formation maps a natural space-time, which we call **consistent spacetime**. Our spacetime model is natural because it connects real, creative-layer events with spatial elements into a process that has a temporal extension. Events related to spatial elements and their temporal extension cannot be separated.

The consistent spacetime interpretation meets the realist expectations of A. Einstein as well as the realistic results of quantum theory, which is considered non-realist.

If we start from kinetic energy instead of time, then we can derive the time coherently. All we have to do is express the velocity v from the kinetic energy relation $E_k=1/2mv^2$ and derive the time $x/v=t$ from it, where x is the distance traveled between quantizations. Since kinetic energy is inherently a relativistic quantity, the time derived from it is also relativistic, and there is no need to apply any subsequent dilation or transformation.

The various theories of relativity do not question the existence and effect of kinetic energy, they simply derive it incorrectly at present. Kinetic energy can be interpreted in any frame of reference or inertial system, and in the interactions between them, without transformation.

It is fully used by quantum mechanics and point mechanics. In the case of real bodies and extended materials, it is necessary to introduce the effect of quantization information built into the material. This task is performed by spacetime-operators.

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[35]Einstein, Albert (November 25, 1915). "Die Feldgleichungen der Gravitation" Sitzungsberichte der Preussischen Akademie der Wissenschaffen zu Berlin, 844-847.

[36]https://hu.wikipedia.org/wiki/Cosmological_constant

7. MOTION ENERGY AS A BASIC QUANTITY

We have chosen a basic quantity that can be used equally well, without transformation, for dynamic effects, high motion speeds, and realistic materials and energy packages consisting of quantizing elements. Not only the rate of its change, but also its absolute value can be determined relative to its environment.

The kinetic energy of a mass point can be determined relative to its environment and also meets the requirement of mass and energy equivalence[37]. It is a quantity known and used in point mechanics for centuries. The energy conservation laws were adapted to it. With its use, taking into account relativistic mass forces does not cause any problems, because kinetic energy itself is a relative quantity that gives a real value in any inertial frame.

The axiom of conservation of energy (the first law of thermodynamics) states that the total energy of an isolated system is constant. The change in the total energy of a non-isolated system is equal to the sum of the energies introduced into the system from outside. All we do is track the effect of the change in kinetic energy from molecule to molecule, between bodies, or even from galaxy to galaxy.

Kinetic/motion energy is a measurable physical quantity that is practically transferred losslessly between gas molecules. During molecular collisions, kinetic energy and potential energy are converted back and forth.

Kinetic energy can be expressed by the equation $E_k = 1/2\, mv^2$, where *m is* the inertial mass of the mass point (atom, molecule, celestial body) and v^2 is the square of the velocity of motion relative to its environment. The kinetic energy of a mass point can be calculated from the mass or velocity, based on the knowledge of the other variable. The magnitude of kinetic energy in the case of a collision or braking can also be determined from the effect exerted on its environment.

If we have multiple mass points or multiple collisions occur, it will be necessary to introduce information about the frequency of the collisions, because this determines the average effect, pressure, and force that a given kinetic energy exerts on its environment at a macro level.

The same amount of kinetic energy exerts a greater average force, or pressure, or impulse integral, on its surroundings if the mass point bounces more often in a narrower gap.

The importance of energy is shown by the fact that the lobby of quantum physicists has included the quantity denoting energy " *electronvolt (eV)* " in the SI system of measurements – as an incoherent quantity. Of course, it is not coherent with the concrete temperature and time! Unfortunately, the SI has chosen the wrong one from the contradictory quantities! Thus, quantum mechanics continues to have a subordinate role in the physics of the macro world.

We propose to include the kinetic/motion energy of the mass point in the basic quantities of the SI system of units. At the same time, it is advisable to limit the use of the quantities time and temperature to static and low-velocity states, where the results numerically coincide with those calculated based on point mechanics.

[37] https://hu.wikipedia.org/wiki/T%C3%B6meg-energia_equivalencia

8. VENTURI TUBE ENERGY BALANCE

Instead of the usual design with a pressurized inlet, we use a Venturi tube with an inlet that is freely filled with ambient air. The energy needed to replace the flow losses and maintain the flow is provided by the depression of a vacuum cleaner. We use this solution so that the acceleration of the molecules flowing into the constriction is created only by the serial collisions of the ambient air molecules, and not by the potential energy of a pressurized tank providing an inlet pressure step relative to the background pressure.

The dimensions of the Venturi tube are: inlet diameter D_1 =26 mm, constriction diameter D_2 =9 mm, outlet diameter D_3 = 26 mm. The total length is 160 mm.

Figure 6, the diffuser of the Venturi tube is connected to the inlet of the industrial vacuum cleaner. The measuring points, which end in the prepared injection needle, are formed in the constriction and at the end of the diffuser.

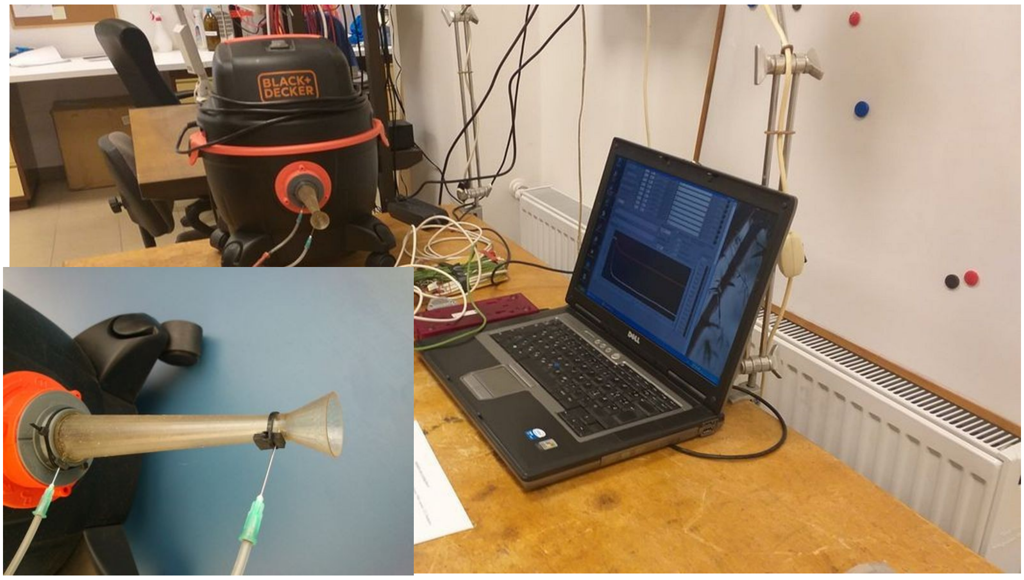


Fig.6. Venturi tube

The inlet of the Venturi tube, i.e. the large diameter of the confuser, is freely filled with the ambient still air. The opening of the measuring points is parallel to the flow streamlines, therefore it is suitable for measuring the static pressure of the flowing air. We did not use a full Pitot tube because, assuming adiabatic acceleration, the total pressure in the confuser is constant and equal to the absolute pressure of the ambient still air.

The prepared measure is on *Fig. 7.*

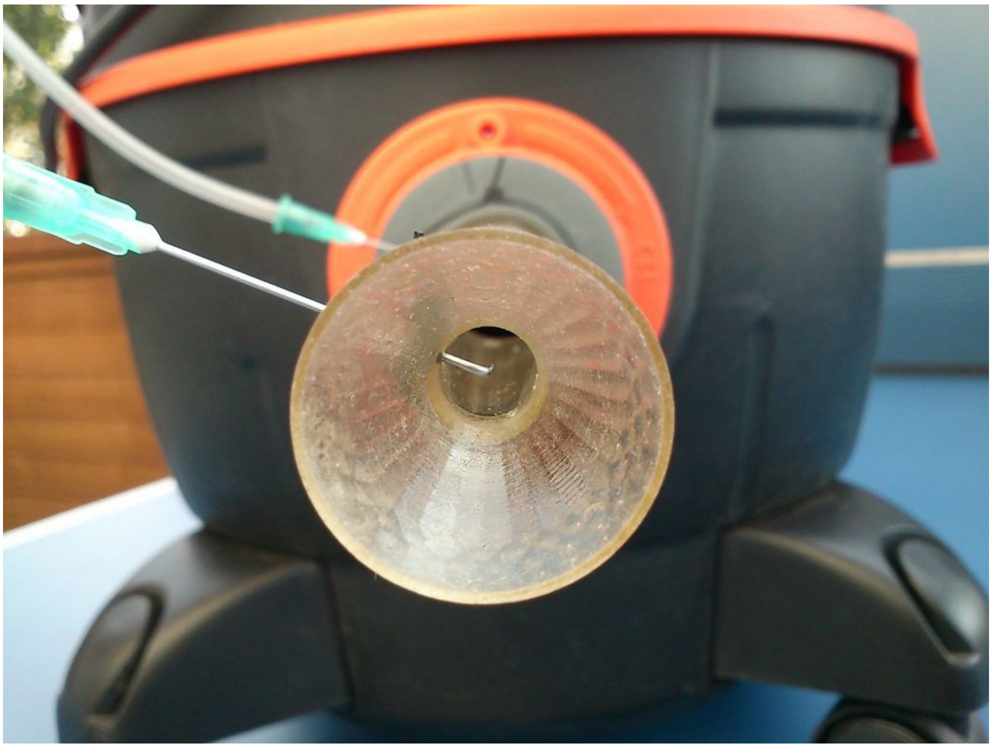


Fig.7. Pressure sensor

The measurement took place in the PMK hall of the ENERGY SCIENCE RESEARCH CENTER OF THE HUNGARIAN ACADEMY OF SCIENCES on 23.09.2021.

Present were:

Dr. Ákos Horváth, Director General and his colleagues

Dr. István Magai and his colleague

The implementation of the measurement is documented in the Measurement Protocol below.

Measured data used to calculate flow rate:

Ambient air T_1 = 292.5 K

Total pressure of ambient still air p_1 = 1.00 bar

Static pressure measured in the constriction p_2 = 0.57 bar

Static pressure measured at the end of the diffuser p_3 = 0.88 bar

In the calculations, we assume ideal air, adiabatic and isentropic flow, and finally we take into account the external work done by the vacuum cleaner to cover the flow losses. If the flow were ideal and lossless, the measured pressure drop would also occur in the constriction, only a negligibly small pressure step would be required at the end of the diffuser, at the vacuum cleaner, to create and maintain the flow.

Protocol in Hungarian bellow: “Mérési Jegyzőkönyv”

MÉRÉSI JEGYZŐKÖNYV

Helyszín:
Magyar Tudományos Akadémia, Energiatudományi Kutatóközpont, PMK csarnok, 1121 Budapest, Konkoly-Thege Miklós út 29-33.

Kelt: Budapest, 2021.09.23.

Jelen vannak: Horváth Ákos Csanád
Magai István

Mérés célja: Dr. Magai István által biztosított Venturi cső áramlástani vizsgálata.

Mért eszköz: 26/9/26 mm átmérőjű, 160 mm hosszúságú Venturi cső kiépített mérőhelyekkel

Mérőeszközök:

1. LabJack U6 adatgyűjtő (gysz.: 360011367) PC-vel vezérelve 1 db
2. Panasonic ADP5171 nyomásérzékelő 2db
3. K típusú hőelem 1 db
4. max. 0,15 bar vákuumot létrehozó ipari porszívó 1db

Mérés menete:

1. A Venturi csövet a diffúzor oldalával a porszívó szívó nyílásánál rögzítjük. A konfuzor oldal a szabad levegővel töltődik akadálytalanul.
2. A szűkületben, illetve a diffúzor végén az áramlási keresztmetszet középvonalában rögzítjük a statikus nyomás mérésére kialakított nyomásérzékelőket.
3. Megmérjük a környezeti levegő hőmérsékletét 10 perces beállási idő elteltével, és leolvassuk a nyugalmi nyomásértékeket.
   t (Co) = 19,5
   $p_{torokban}$ (bar)= 1,00
   $p_{diffuzor}$ (bar) = 1,00
4. Elindítjuk a PC-n a mintavevő programot, majd indítjuk a porszívót. 10 másodperc mintavétel után leolvassuk a kijelzett nyomásértékeket, majd leállítjuk a porszívót és leállítjuk a mintavételt. A mintavevő program kirajzolja a vett mintákat idődiagramban, amit lementünk, és lementjük a vett minták csv formátumú fájlját utófeldolgozásra.
5. A mérést 10 alkalommal megismételjük. A leolvasott nyomásértékeket az alábbi táblázatban rögzítjük, a 10 mérés számtani átlagát kiszámoljuk:

mérés	1	2	3	4	5	6	7	8	9	10	átlag
$p_{torokban}$ (bar)	0,56	0,57	0,57	0,58	0,57	0,57					0,57
$p_{diffuzor}$ (bar)	0,88	0,88	0,88	0,88	0,88	0,88					0,88

A mérőeszközök kalibrálásának dokumentumait a melléklet tartalmazza.

A mérés megtörténtét és az adatok helyes felvételét jelenlévők aláírásukkal igazolják:
k.m.f.

The course of the measured pressure values is illustrated in the following register *in Figure 8*. The white curve shows the static pressure of the throat, the red curve shows the static pressure of the diffuser end as a function of the elapsed time.

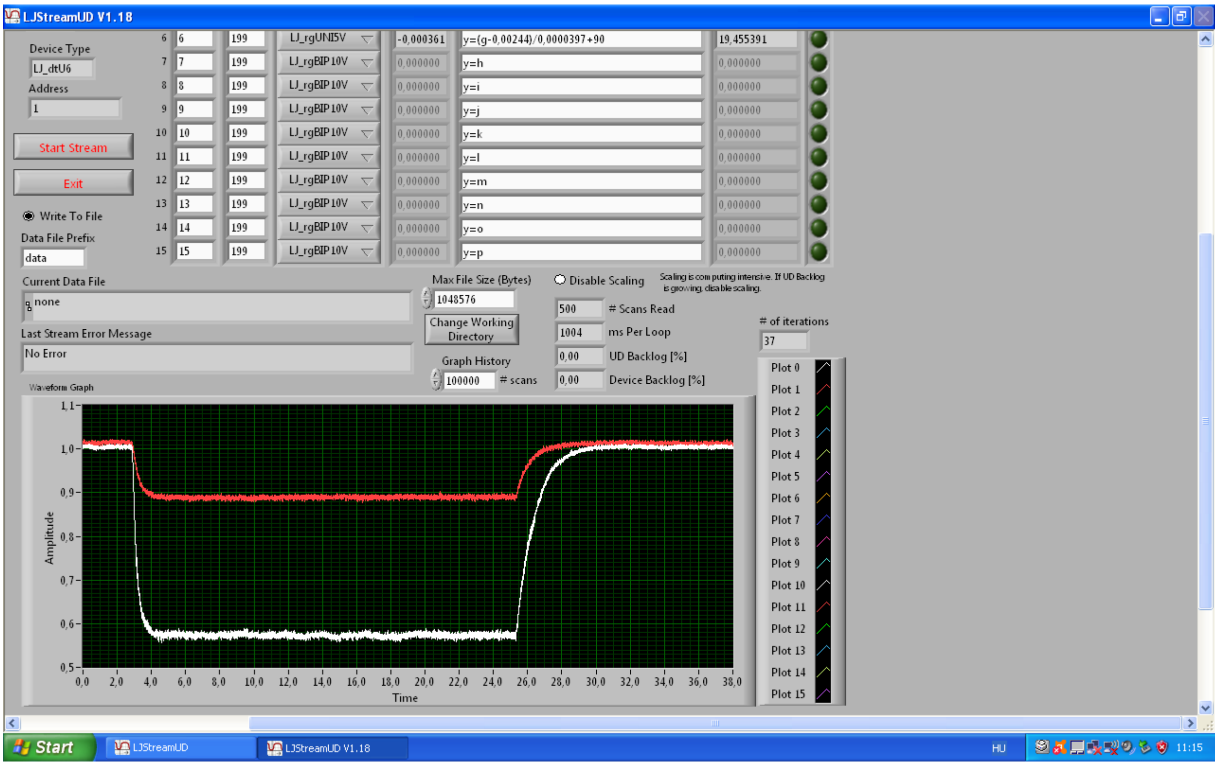


Fig.8. Static pressure-time functions

From the data in the protocol it can be established that the static pressure drop created by the vacuum cleaner d_p=1-0.88=0.12 bar is accompanied by a static pressure drop in the constriction d_p=1-0.57=0.43 bar. The mass flow is the same inside the Venturi tube.

Average flow velocity v_2 in the constriction using the known equation valid for compressible gases, where v_1 is the velocity of the incoming air, γ is the adiabatic exponent, in our case 1.4. The measured p_{s2} = 57 kPa, p_1 = 100 kPa, universal gas constant R=287 J/kgK.

$$v_2=\sqrt{v_1^2+\frac{2\gamma}{\gamma-1}RT_1\left[1-\left(\frac{p_{s2}}{p_1}\right)^{\frac{\gamma-1}{\gamma}}\right]}$$

The velocity v_1 is neglected because the cross-sectional ratio A_1/A_2 is $26^2/9^2$=8.34. The square of this is 69. The error thus made is less than 1.5%.

Substituting the values:

v_2 = 295 m/s

A_3 of the diffuser outlet is the same as the cross-section A_1, where we assumed that the flow velocity is negligible. The vacuum cleaner can produce this pressure reduction by accelerating the air. This pressure step of d_p=0.12 bar can be produced if the vacuum cleaner accelerates the air to a velocity v_p before blowing it out.

In the calculations, we neglected the temperature change due to fluid friction, which results in an error of less than 5% at a velocity of v_p.

$$v_p = \sqrt{v_1^2 + \frac{2\gamma}{\gamma-1} RT_1 \left[1 - \left(\frac{p_{s3}}{p_1}\right)^{\frac{\gamma-1}{\gamma}}\right]}$$

Substituting the values:

v_p = 145 m/s

kinetic energy of the air flow with a speed of v_2 = 295 m/s, which originates from the kinetic energy of the molecules flowing in from the outside space, is proportional to the kinetic energy of the air flow v p = 145 m/s, which is necessary to maintain the flow, and which is created by the vacuum cleaner. The resulting ratio shows how many times the kinetic energy calculated in the constriction is greater than the energy required to operate the Venturi tube.

$v_2^2 / v_p^2 = 295^2 / 145^2 = 4.14$

After deducting the work of the vacuum cleaner, the kinetic energy of the air flowing through the constriction exceeds the external work required to maintain the process, i.e. to cover the losses, by 4.14-1=3.14 times.

With this ratio, we prove that the kinetic energy of the flow experienced in the narrowing of the Venturi tube is nothing more than a part of the kinetic energy of the molecular quantization/thermal motion regulated by the Venturi tube.

With this experiment, we also prove that a greater portion of the kinetic energy of molecules in normal ambient air is converted into regulated flow motion energy than the amount of energy required to replace the losses.

This sentence may seem incredible to those who think in terms of the continuity principle, but for reassurance, let us consider that the vacuum cleaner can only create a depression of 0.15 bar (even if we completely close its opening) and the vacuum cleaner itself is not enough to create the flow velocity corresponding to the 0.43 bar pressure drop in the throat. The energy deficit can only be compensated for by the kinetic energy of the air molecules, through molecular collisions, because there is no other external energy source that could intervene in the process before the constriction. The average (thermal) motion speed of nitrogen and oxygen molecules relative to their environment is 500 m/s at a temperature of 25 °C and an ambient pressure of 1 bar. The internal (thermal) motion energy of the gas molecules in 1 m^3 of normal ambient air *is* $E = 0.5 * 1.2 * 500^2 = 150$ kWh. It's all kinetic energy.

Kinetic energy can be obtained at the expense of the quantization (thermal motion) of the molecules, even if the nozzle temperature is higher than the static temperature of the working fluid. The obtained kinetic energy is used for increasing the velocity of the fluid flow.

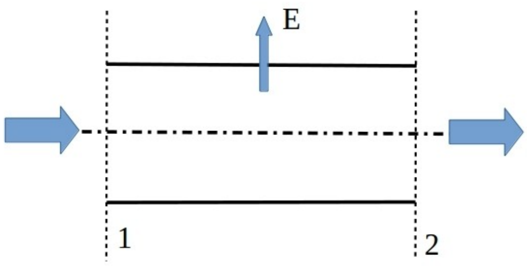
The kinetic temperature of the molecules decreased, but this process cannot be called cooling because there is no surface colder than the flowing fluid that is capable of absorbing heat, so it cannot conflict with the second law of thermodynamics.

9. FLOWING GAS COOLING

In a stationary, gaseous fluid, molecules and atoms collide elastically, transferring kinetic energy to each other, i.e. to their surroundings, and vice versa. In the case of a liquid, the particles performing thermal motion are also affected by other forces, but they are also quantized as a result of relative motion, but we will not discuss the specifics of this here.

In the case of a flowing gaseous fluid, heat transfer and acceleration or deceleration of the fluid flow are associated with a change in the rest mass, i.e. the energy state of all particles present (if there is enough time for the change to propagate). Due to thermodynamic changes, especially after heat transfer, and due to thermal equilibration, the kinetic energy of all molecules changes, but only a certain fraction of it affects its environment in the form of collision processes, which also appears as a change in static and stopping pressure. The rest of the kinetic energy remains hidden because it is carried by molecules moving in a collisionless state.

Figure *9,* ideal air flows into the flow tube at cross section *1* and flows out into the environment at cross section *2. By cooling the uninsulated tube wall from the outside, energy E* is released into the environment. In such cases, the literature[38] usually calculates with the entropy[39]-based Rayleigh flow equations[40]. We take the example of P. Balachandran[41] as a basis. The velocity of the incoming air flow is v_1 = 200 *m/s*, its static temperature is T_{st1} = 300 *K*, its static pressure is p_{st1} = 100 *kPa* and the energy absorbed between points *1-2* is *E*= 50 *kJ/kg.* (The detailed calculation is available at the footnote link.)



9. ábra: Szigeteletlen áramcső

Results: outlet velocity v_2 = 0.48 *M,* total temperature decrease ΔT_o = 49.75 *K,* total pressure increase Δp_o = 13.02 *kPa.* The result shows that the outflow occurs with an overpressure of 13 *kPa compared to the inflow.*

The reduction of the kinetic temperature, and kinetic energy, of the molecules causes an increase in total pressure and performs physical work towards the environment.

A specialist familiar with gas laws might think that this is a measurement and theoretical error, because the collision of a cooled molecule, which has lost kinetic energy, can exert less pressure on the pressure measuring surface. Nor could the deceleration be compensated – we might think – if more molecules, " *cooled closer together* ", collided per unit area. However, there is an additional effect that overshadows this convention. This is quantization information. The device *in Figure 9* is practically a pressure booster without moving parts, which is not a compressor driven by external work. The fact that the smaller collision distance of the quantizing molecules has a pressure boosting effect should not be surprising based on our second ping-pong ball experiment.

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[38]Jyh-Cherng Shieh, Fundamentals of Fluid Mechanics, National Taiwan University, Chapter 11. P169.
[39]www.britannica.com/science/entropy-physics
[40]www.Imnoerg.com/Flow/rayleigh.php
[41]A *P. Balachandran, Gas Dynamics for Engineers, Indian Space Research Organisation, Trivandrum, New Delhi 2010. P 152. Problem 1.*

The numerical example shown *in Figure 9,* calculated with quantization information, gives: v_2 = 0.34 *M*, ΔT_o = 46.4 *K*, $\Delta p_o = po_2 - po_1$ = 128.1-115= 13.1 *kPa.* We find a trend that is identical to the calculation based on enthalpy, but the calculation is much simpler, yet consistent.

The following equations describe the changes in kinetic energy of molecules relative to their environment. In flowing gaseous media, we traditionally distinguish between static characteristics, which are interpreted in a "*co-moving*" frame, and the stopping or total characteristics, which are interpreted in an absolute or stationary frame of reference. By subtracting the static, co-moving characteristics from the stopping or total characteristics, we obtain the dynamic characteristics of the flow.

As an example, in an adiabatic nozzle, in the case of an ideal fluid and lossless flow, part of the molecular kinetic energy is converted into flow kinetic energy . (see venturi experiment in the previous chapter) During adiabatic acceleration, between the inlet 1 and outlet 2, the molecular quantized average velocity v_{m1} decreases to v_{m2}, while the flow velocity increases from v_1 to v_2.

In an adiabatic process, we assume that the entire part of the quantization kinetic energy of the molecules with a total mass *m is used to accelerate* the flow of the fluid with a mass *m* . The change in kinetic energy can be calculated identically both at the molecular, i.e. creative, and macroscopic levels: $E_k = 1/2mv^2$, therefore, after simplifying with the mass *m,* the molecular and macroscopic kinetic energies calculated with the square of the velocities can be summed up:

$$v_{m1}^2 - v_{m2}^2 = v_2^2 - v_1^2 \tag{1}$$

From the above, the rate of change of kinetic energy is:

$$\frac{E_2}{E_1} = \frac{v_{m2}^2}{v_{m1}^2} \tag{2}$$

spacetime-operator β calculated from the change in kinetic energy .

$$\beta = \frac{v_{m2}^2}{v_{m1}^2} \tag{3}$$

Since molecules move in a straight line between collisions:

$$v = \frac{l}{t} \tag{4}$$

where *t is* the average time between collisions, *l is* the free collision distance and *v is* the average velocity of the molecule. For a reduced distance *l ,* the time between collisions *t is* also proportionally smaller. Since it follows from equation (3) that the rate of speed reduction is inversely proportional to the square root of β . The spacetime-operator for increasing the frequency of collisions is:

$$\beta^{1/2} = \frac{t_2}{t_1} \tag{5}$$

As the collision distance decreases, the molecules fill the space more densely, therefore, β^2 times more molecules with kinetic energy reduced by the ratio β of the pressure measuring surface participate in creating the pressure. The $l^2 = v^2 t^2$ from the product is the spacetime-operator of the increase in the number of molecules.

$$\beta^2 = \frac{l_2^2}{l_1^2} = \frac{v_{m2}^2}{v_{m1}^2} \frac{t_2^2}{t_1^2} \qquad (6)$$

In calculating the static pressure spacetime-operator calculated for point 2, we take into account the sign effects of deceleration, frequency increase, and molecular number increase by multiplying the β spacetime-operators.

$$p_2 = p_1 * \beta^{(-1)} \beta^{(1/2)} \beta^{(2)} = p_1 * \beta^{(3/2)} \qquad (7)$$

If we know the rate of change in molecular kinetic energy, change in quantization rate, or change in static pressure, we can determine the current beta factor from one of them. Using the beta factor, we can determine the other characteristics associated with the change.

In the case of a gaseous fluid, the beta factor and its powers form the spacetime-operators for calculating further quantities.

We note that virtual quantities, such as temperature, specific heat, and entropy, can still be calculated using the known virtual relations, because in principle they cannot be derived consistently.

Calculation of the ideal flow between inlet 1 and outlet 2 of an adiabatic nozzle with the spacetime-operator β, with flow velocities v_1 and v_2. In the right column are the known thermodynamic relations:

QUANTITIES	SPACETIME-OPERATOR	THERMODYNAMICS
p static pressure	$p_2 = p_1 * \beta_2^{(3/2)}$	$p_2 = p_{02} * \left(1 - \frac{(v_2^2 - v_1^2)}{2 * \gamma/(\gamma-1) * RT_{01}}\right)^{\frac{\gamma}{(\gamma-1}}$
***v** **m** molecular velocity*	$v_{m2} = \sqrt{v_{m1}^2 + v_1^2 - v_2^2}$	$v_p = \sqrt{2kT/m}$
β spacetime-operator	$\beta = \frac{v_{m2}^2}{v_{m1}^2}$	--

10. GAS FLOW NEXT TO A WALL

The "fluid friction" or *"flow loss "* described in the system of continuum mechanics can also be well described in consistent spacetime. In the case of a realistic, slowed flow along a wall, the kinetic temperature change is created by two factors. The first is that under the influence of an external force, a part of the kinetic energy of the gas is converted into disordered (heat) motion, which increases the kinetic temperature and decreases the dynamic pressure. The other effect is the kinetic temperature decrease and static pressure increase associated with the molecular collision distance that has been reduced from the stationary wall, which can be expressed with a spacetime-operator. The result of these two effects gives the kinetic temperature change. Assuming point-like molecules and an ideal process, these two effects eliminate each other. In the case of real gas molecules, the collision cross section, the mean free collision distance, and the average velocity of the molecules must also be taken into account.

In summary: The flow along the stationary wall – with an ideal gas, in the ideal case – has a flow-retarding effect, but it is neutralized by the effect of increasing the static pressure and decreasing the kinetic temperature. In the real case, the neutralization covers a dynamic equilibrium, which also serves as an explanation for the different points of the laminar-turbulent transition and the back transition known in connection with the Reynolds number. The densification and rarefaction of the flowing molecules, which we call up and down, require a trigger element, which starts the positive feedback with a specific energy step.

Another well-known phenomenon is that when the effective cross section of the average molecule of the triplet isotope of helium at a kinetic temperature close to absolute zero Kelvin approaches the size of the free collision distance, the superfluid state[42] is formed. Here we no longer experience internal friction or measurable viscosity. The molecules move almost unhindered, so their quantized thermal motion can be approximated by elastic collisions.

Below the lambda point of helium-3 (2.17 K), in the 80-100 atom thick layer of the superfluid *"moving upwards "* on the wall of the vessel, the molecules in contact with the warmer wall begin to heat up, as a result of which the static pressure of the set of molecules capable of nearly free thermal movement decreases from molecule to molecule collision. The helium layer in contact with the wall is pressed against the wall by the ambient gas and displaces it towards the lower pressure. Thus, the superfluid helium-3 crawls up the wall towards the warmer part of space, even against the gravitational attraction. During the "climbing the wall", evaporation also occurs, which reduces the kinetic temperature of the liquid with the (thermal) energy carried away, and thus stabilizes the fluid as long as there is helium-3 and an attached warmer ambient point.

A similar phenomenon can be observed during the stifled outflow of real gases[43]. Below the inversion point characteristic of the given gas (according to Joule-Thomson, at 1 bar before expansion: helium 51 K, nitrogen 621 K and oxygen 764 K), the decrease in pressure and the increase in velocity are accompanied by a decrease in temperature. Expansion above the inversion point is accompanied by an increase in temperature.

In the case of throttling of the real gas, the accelerated outflow is created by the pressure drop in the nozzle. After throttling, the ratio of the mass of the accelerated molecules, their effective collision cross-section, and their free collision distance determines whether the result of the external mechanical effect will be an increase or a decrease in kinetic temperature. Below the inversion point, the kinetic temperature decrease caused by the pressure drop cannot be offset by the increase in molecular kinetic energy during expansion, so the resulting effect is a decrease in temperature. Above the inversion point, the kinetic temperature decrease caused by the pressure drop is exceeded by the kinetic energy, i.e. the higher kinetic temperature, of the expanding gas molecules, so heating is the determining factor.

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[42]Sasvári László, Akvantumfolyadékok csodái, ELTE Fizikai Intézet, Komplex Rendszerek Fizikája Tanszék 2012.
[43]fiziziszemle.hu/archivum/fsz8508/cikkradnai8508.html

11. HEAT AND ENERGY

The concept of energy was first used by Aristotle to express the " *capacity for change* " [44], and later by I.S.Newton to illustrate kinetic energy and potential energy. The driving force of heat, or in general the principle of conservation of energy, was described in its present form by J. P. Joule in 1846, and then by R. Clausius[45] in 1850. In the 1860s and 1870s, the work of J. C. Maxwell, L. Boltzmann, R. Clausius and W. J. M. Rankine on the motion of atoms, among others, demonstrated that " *the interpretation of the second law of thermodynamics - especially in the case of irreversible processes - is not possible using purely mechanical principles"* [46].

To illustrate heat (energy), R. Clausius introduced the concept of entropy in 1865 [47], based on which he formulated the first two laws of thermodynamics as follows: "the *energy of the universe is constant"* and *"the entropy of the universe tends to a maximum".* This statement would lead to the " *vision of heat death* ", but it is known that it wrongly infers the behavior of a closed, isolated system about the universe as a whole. The theoretical error was revealed by the collision with practice, but the debate about its correction and its relation to disorder is still ongoing.

The above theories treat heat, as one of the forms of energy, as a continuum, which inherently excludes the description of real energy transfer processes of quantized moving molecules. Simplifying and reducing real effects to a continuum helped in the numerical solution of technical problems, but the theoretical relationships remained hidden. Practice treats this phenomenon numerically using specific heat without providing a consistent explanation.
Heat transfer involves a change in the rest mass, or energy state, of all particles present. Particles transfer kinetic energy to their surroundings during collisions. If we introduce heat into a set of molecules, that is, we increase the kinetic temperature, or kinetic energy, of the molecules at the interface, then the heat transfer cannot be continuous, because it can only propagate towards the interior of the set through quantizations. It follows that **treating heat, or thermal energy, as a continuum is fundamentally wrong.**

A part of the molecular kinetic energy transferred during thermodynamic processes remains hidden after the heat transfer , because the kinetic energy of all molecules changes due to thermal equilibrium , but only a certain part of it affects its environment during collision processes. The rest of the kinetic energy remains hidden because it is carried by molecules moving in a collisionless state. The effective and ineffective molecules are exchanged from time to time.

In the case of gas molecules, the duration of collisions and the time ratio of free travel depend on the kinetic energy of the molecules, the collision characteristic cross section and the free collision distance. When calculating the characteristics of a thermodynamic process, the heat transferred, which " *warms up* " the rest mass of the particles, is contrasted with the pressure change, which is proportional to the momentum integral of the inertial mass of the particles striking the pressure sensor plate. It is no coincidence that correction factors are also needed for the calculation. However, these are not consistent quantities in the continuum theory, but rather empirical values that are not supported in principle.

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[44] www.kfki.hu/elftterm/kelvin.html
[45] www.kfki/~cheminfo/hun/olvaso/histchem/simonyi/ho4.html
[46] www.kfki/~cheminfo/hun/olvaso/histchem/simonyi/ho4.html
[47] Cropper, William H. The Road to Entropy Rudolf Clausius, Oxford University Press, P 93-105.

Based on the above, it can be seen that the change in the kinetic energy of all involved atoms or molecules can only be described with a consistent spacetime relationship due to quantization effects.

In a liquid or solid, particles " *performing thermal motion* " are less mobile than in a gas due to the forces arising from the countless potential bonds. The smaller molecular collision distances would increase the quantized effect on the environment, but the new bonds and forces have the opposite effect. The resulting effect is generally that the more or stronger the bonds, the more latent heat, i.e. the internal stored energy.

Same molecular kinetic energy, or the potential force field acting on the moving part, exerts a different effect, such as a different pressure or physical work, on its environment if the event is repeated more often or less often in time. The change in entropy can therefore not consistently reflect either the change in specific energy or the degree of disorder.

The quantizing molecules do not rush to our sensors all at once, but rather fly around freely for a while until they come in turn. **The order is established based on a built-in "(in)formation".**

When we experience a lack of material or energy during practical measurements, we usually say that it may be some kind of internal or latent energy. Thermodynamics also considers thermal energy to be such internal energy, and we usually measure only its effect on the environment with a comparative measurement, from which we calculate " *how much energy flows from the warmer body to the colder body on average"* .

There are molecular or atomic collisions in matter, but thermodynamics does not treat them as a characteristic caused by quantizing, kinetic energy-colliding components. With fictitious numerical methods, specific heat and temperature differences, we can calculate the change in internal energy for a given mass, but we cannot localize, sense, measure, or reverse the change.

We absolutely cannot repeat a heat transfer experiment, because heat is only transferred from the warmer body to the colder one. We cannot restore the initial state, we can only try a new, similar, parallel experiment if we want to validate our measurement method. This is what the second law of thermodynamics says.

We do not usually consider time in thermodynamic energy conversion processes. Thermodynamics based on practical experience uses the SI-compatible basic quantities of temperature and mass, but by excluding the basic quantity of time, it violates the coherence condition, meaning that it is not possible to derive the change in time from the change in temperature by multiplication and exponentiation.[48]

Based on the above, we must say that thermodynamics is not compatible with the SI system of units. Is the derivation of time or the derivation of temperature at fault, or perhaps both? Thermodynamics is based mainly on empirical knowledge, and therefore reflects experience, if interpreted correctly.

"Mole[49]" quantity of substance was included in the SI base quantities under pressure from chemists, because they did not want to suffer with more than 5 physical definitions of mass.

[48] https://www.academia.edu/35859617/Thermodynamics_and_Statistical_Mechanics_An_Integrated_Approach_Robert_J_Hardy_Christian_Binek_pdf?email_work_card=title

[49] https://hu.wikipedia.org/wiki/Materials%C3%A9g

12. DARK MATTER THAT'S NOT SO DARK

The term " *dark* " [50]was given to the unknown substance because its existence can be assumed based on cosmic phenomena, but it has not been detected so far. The widely used continuum theory simplifies the quantized energy transfer processes of molecules and atoms, reducing them to a continuous effect. The result of the reduction is the contradiction that according to the continuum principle, all molecules in a given part of space should collide with their environment or a sensor at the same time, and cosmic effects should occur simultaneously/not separately. However, this is not the case in reality.

During the pause between collisions, gas molecules do have kinetic energy, but their surroundings are not " *aware* " of it until the next collision occurs. **Molecules with rest mass are present in the given space, but the kinetic energy of some of them remains temporarily ineffective. We can also say that their mass is not missing from the inventory, it is just that continuum-based measurements do not detect it.**

Continuum mechanics, based on the momentum conservation theorem[51], considers the inertial mass and the theoretical rest or passive gravitating mass to be equal, or sometimes identical, at "*low speeds*". The calculation of dynamical effects is based on the inertial mass, which is also retained in the theory of relativity[52], which uses independent dimensions, fields, and a continuum-energy definition.

At this point, one of the most significant errors in continuum theories becomes apparent: the misinterpretation of the relationship between inertial mass and rest mass [53].

Rest mass constantly present in the given physical space, regardless of collisions , where gravity acts on it, producing subatomic phenomena, or manifesting itself in chemical processes, either according to the number of molecules or their valence. **Thinking in consistent spacetime, we can say that the missing matter, compared to the dynamic effects assumed in cosmology, is there, it is just playing hide and seek with us.**

Returning to the collision of gas molecules, the duration of the collisions and the time ratio of the free run depend on the kinetic energy of the molecules, the collision characteristic cross section and the free collision distance. Since the known matter of the universe is more than 90 *%* hydrogen and helium, the characteristics of the motion of their atoms, molecules and ions can be considered as a sufficiently general rule that permeates the material world. The "*dark*" part of the universe is identical to the visible part – with a small phase delay – and therefore the 90% hydrogen-helium ratio can also be applied to the "*dark*" part. What we wrote about the quantization of molecules is valid for other quantizing processes, such as the rotation, pulsation and expansion of celestial bodies.

It follows from the above that **the location of dark matter is statistically the same as the location of non-dark matter**. This is why it has not been found using the continuum principle so far.

The collision process is the effective part, and the free run is the ineffective part. The average ratio of " *effective/ineffective* " kinetic energy is currently estimated to be 1/20 in the Earth's atmosphere, and

[50]claps://scitechdaily.com/is-dark-matter-warm-cold-fuzzy-new-simulations-provide-intriguing-insights/
[51]fizipedia.bme.hu/index.php/Megrádasi_tövények_a_mechanikakán
[52]Albert Einstein, Special and General Relativity, Gondolat Budapest, 1973. P. 32.
[53]Albert Einstein, Special and General Relativity, Gondolat Budapest, 1973. P.38.

1/3 in the average of the known universe, which decreases due to the expansion of the universe. In the object known as a black hole[54], the ratio exceeds 10^{5}. The closer we assume a state to the theoretical starting point of the known universe, the average (effective/ineffective) kinetic energy ratio could have taken the largest value in existence, meaning that our world could have consisted of a predominantly " *light-like* " part.

The energy content and reactions of subatomic particles were not included in the dark matter estimate because, according to the mass-energy equivalence[55], they are already represented in a bound form by the gravitating mass. It is also worth clarifying the definition of rest mass based on the consistent space-time relations.

As the known universe expands, the amount of ineffective kinetic energy increases at the expense of effective kinetic energy, but the sum of effective and ineffective kinetic energy and matter remains constant. We can also say that the expanding universe is " *darkening* " overall.

We can say that **the concept of dark matter was born as a result of theoretical and measurement errors. Its assumption is based on the mistakenly applied identity hypothesis of rest mass and inertial mass.[56] [57] [58].**

[54]https://science.nasa.gov/astrophysics/focus-areas/black-holes
[55]www.vilaglex.hu/Lexikon/Html/TomEnOsz.htm
[56]YEARBOOKS OF THE HUNGARIAN ACADEMY OF SCIENCES, VOLUME SIXTEENTH 1877-1882. BUDAPEST 1884. BR. EÖTVÖS LORÁND P. 60.
[57]Szabados B. László, One Hundred Years of General Relativity, MTA Wigner Research Center for Physics, January 25, 2015. P. 4.
[58]https://fizipedia.bme.hu/index.php/Speciális_relativitáselmélet

13. EXPANSION OF THE UNIVERSE

The supposed " *dark energy* " is associated by some with a kind of " *negative pressure*[59] " energy, which could be the cause of the " *accelerating expansion* " of the universe. Our theory of space-time offers a realistic explanation for this phenomenon as well.

The key is the Laval nozzle[60] [61] which is a well known equipment with interesting behavior. We used a Laval nozzle as a Venturi tube in chapter 8. on the subsonic range.

In our experience the flow rate of the throat was below local speed of sound, so the diffuser caused decreasing flow rate and increasing static temperature and pressure.

If we meet the local speed of sound in the same throat which was 318 m/s, the process changes totally. The flow rate is increasing, the static temperature and pressure are decreasing in the diffuser.

The trigger is the speed of sound: If flow rate is bellow local speed of sound or reach it. The result is adiabatic expansion or approximation.

These alternative processes don't need any additional energy to proceed. They need a small trigger condition only in speed.

Our quantization model is usable in molecular or cosmic range. The orbiting objects have same physical laws and conditions as quantizing molecules in the Laval nozzle.

The orbiting object can run with increasing velocity without any pulling energy outside. The process can adiabatic.

If the expansion exist than it causes self sustaining process until the trigger condition is not changed. The gravitational force wasn't enough to decelerate or destroy the expansion of the Universe. We need something else for changing trigger.

Generally expanding Universe do contain local trigger conditions which result local contraction. Some of the results are the mass of the planets and molecules or atoms.

Our conjecture is that the quantization effects associated with the transfer of kinetic energy of the components significantly contribute to the formation and enhancement of matter and energy inhomogeneities at the macro-nano scale.

We do not know the specifics of the formation and operation of objects called black holes, but it is worth considering whether factors other than gravitational force, previously thought to be hidden, include quantized clumping or voiding occurring in real and in consistent spacetime.

If the quantizing plasma particles get so close to each other that collisions in spacetime can no longer work, then the additional static pressure increase from the outer layers due to the decrease in collision distance also ceases. At this point, the high-density core loses its pressure-bearing envelope, or part of it, and the black hole can explode or blow out. The blowout temporarily stabilizes the core.

We cannot rule out the possibility that no light comes out of the black hole because it is not produced. There is only radiation emitted when nuclear processes temporarily start.

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[59] PAShaver, L. DiLella, A. Giménez: Astronomy, Cosmology and Fundamental Physics, Springer 2002. P 484.
[60] en.citizendium.org/wiki/De-Laval_nozzle
[61] www.grc.nasa.gov-WWW/K-12/airplane/nozzled.html

During the explosion, the particles of the core and the surrounding plasma, overcoming the " *gravity"* , begin to move away from each other (faster than the local escape velocity), which movement has a static pressure-reducing effect. Thus, the individual shells, in contrast to those experienced during densification, produce a decreasing static pressure, facilitating further movement away, which increases the expansion until some external effect causes the particles of a cluster to approach each other, and thus an additional increase in pressure. If the size of the new subset is large enough, a new black hole can be formed. If the cluster is small, some celestial body can also form.

Expansion, as an energy conversion process, is a concept that exists in continuum mechanics, but on a macro and cosmic scale it can only be considered fictitious or phantom information created by reduced systems and theories based on reduction.

Based on the above, it can be seen that the set of quantizing effects described by consistent spacetime (collision, circulation, pulsation, vortex...) can by themselves create a phenomenon resembling decreasing static pressure, which does not require an external *"energy source, force field"* .

It is a natural consequence of the quantizing effects taking place in consistent spacetime. Only the continuum principle – due to lack of tools – cannot interpret it, which is why a *"phantom"* effect, the " *mysterious negative pressure"* was needed.

The alternation of expansion and contraction can also result in pulsation if an external effect, such as the effect of a cosmic force field or nuclear fusion, becomes increasingly dominant. It is also possible that the limited amount of components involved in the process brings about the turning point.

14. DOMINO EFFECT

Accepting the reality of consistent spacetime detailed above makes it possible and necessary to modify and reinterpret countless physical definitions and theories.

One of the most important principles is the principle of conservation of energy. Although it is based on empirical facts, its application can raise numerous problems.[62] It is a common mistake to draw conclusions about the entire physical space from the theoretical behavior of matter reduced to a point system or a closed system.

When interpreting and calculating the energy associated with motion, we usually consider the inertial mass as the fundamental quantity, and we connect the driving force and acceleration to it. If we start from the given acceleration and the generating force, we can obtain the inertial mass as the result.[63]

If we were to encounter only point-like objects and continuous effects in physical space, then there would be no reason to question the identity of inertial and rest mass . However, from the peculiarities of molecular collisions, we have deduced that **considering inertial mass and rest mass, consisting of atoms performing quantization motion, to be identical is the result of a false generalization or reduction.**

Current physical theories and models are often created using numerical methods and empirical data, which, although they have significant practical benefits, cannot be considered consistent models. Replacing inconsistent components would not only be theoretically significant, but would also contribute to making the models more accurate.

The refinement of theories and models involving reduction becomes more complicated the more precise the result is sought. In contrast, in creative physics, consistent models and theories, despite their simplicity, provide accurate, realistic results.

Continuum mechanics knows reversible processes, but according to consistent spacetime, these have no real physical content, so they constitute phantom information. Once the information is spread, it cannot be reversed, only something similar can be made, but its antecedent cannot be a clone of an earlier antecedent.

It is also advisable to get rid of sentences like "let's take two independent bodies" or "let's place them in an inertial frame". Such things do not exist, they are only fictitious or phantom elements of inconsistent calculations.

It may be a practical difficulty to get used to observing and operating in consistent space-time, but the result compensates for the learning difficulties. The good news is that most significant relationships can still be used, but only at their creative level, i.e. to a very limited extent.

Quantum mechanics has already played a pioneering role in making the unimaginable accepted by both the profession and the public, if it was beneficial to them. The space-time thinking of creative physics will be child's play in comparison, and what's more, we don't even have to give up our sense of reality and truth, for which A. Einstein would be grateful.

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[62] www.kfki.hu/elftterm/kelvin.html

[63] A.Einstein, Special and General Relativity, Gondolat Budapest, 1973. P.38

15. QUANTUM GRAVITY

"The general theory of relativity, developed by Albert Einstein, describes gravity well from the perspective of classical *physics. However, according to the principles of quantum mechanics, gravity must also be a quantum phenomenon that current theories cannot explain."*[64] we can read.

If the only problem is that gravity doesn't seem like a quantum phenomenon, that could be easily fixed. You just have to follow the definitions carefully:

In A. Einstein's theory, the curvature of the space-time continuum is caused by nearby mass, which is matter made up of quantized particles. By definition, without quantized molecules and orbiting celestial bodies, there is no curvature and no gravity. If there is curvature, there is gravity. Gravity is what the bodies involved are: and they are quantized and orbiting. *"They pull the fabric quantized."*

It follows that gravity must be a quantized quantity, as is more than 90 percent of the universe. Even if spacetime were still a continuum, but as we have analyzed above, gravity cannot actually be a continuum either.

This is good news for quantum physicists, but bad news for those who believe in the space-time continuum.

We have even better news. The consistent spacetime model is inherently valid at both quantum and macro scales. There's no need to connect anything.

Quantization information even fixes energy balances. Moreover, it also displays the process of energy transformations in a realistic and consistent way.

[64] https://mernokkapu.hu/mi-az-a-kvantumgravitacio/

16. SUMMARY

We are looking for a tool that is suitable for the consistent description of both static and dynamic and fast-moving material units, quantum, and macro systems.

To do this, we do not use numerical methods, space warps, or mysterious strings, but rather we examine events in consistent spacetime, using **spacetime-operators .**

We demonstrate that information built into macro systems is worth energy. **We can also say that quantizing mass and energy, through their (in)formation, collectively affect their environment.** The same quantizing mass and energy, in a different formation, exerts a different macro effect.

The formation shows a tangible effect, if 100 soldiers casually walk across a bridge, nothing interesting happens. If they step at the same time, the bridge can break. It caused scary swaying when we tried this effect on a suspension bridge.

In quantum mechanical measurements, the energy of particles is most often measured in electron volts, and is also determined by collisions and absorptions, which is fully compatible with our spacetime-operators, which characterize the kinetic energy of quantizing components.

It is a great leap for quantum mechanics that the embedded information, or spacetime-operator, associated with quantum events allows us to interpret quantum phenomena and events on macro and cosmic scales, and vice versa.

Using consistent spacetime, several previous conjectures[65] that were attributed to mystical quantum entanglements[66] can be proven.

We can also detect the force or momentum integral of the actual collision of the components and the frequency of the collisions with an appropriate measuring device.

Empirical thermodynamics also does not use time to describe cycles. We do not use time as a continuum, but we do not use the fictitious quantity temperature, which is the cornerstone of thermodynamics, either. Instead, we describe energy transformation processes with spacetime-operators, taking into account the information governing the interaction of quantizing components.

If we derive time and other physical quantities from the actually existing kinetic energy, then no transformations and empirical corrections will be necessary.

Consistent spacetime and its **spacetime-operators** are not mathematical products like the relativistic spacetime continuum[67], but rather a **process marker based on the conservation of energy, which unifies mass, energy, and information.**

(The author tried to support his claims with factual, logical arguments, but there may still be errors in the writing. It is important that errors are revealed and corrected, so we welcome any comments, suggestions, or refutations at the email address istvan@magai.eu and other contact details provided on the website www.magai.eu)

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[65] http://www.rmki.kfki.hu/~diosi/slides/simonyi_talk.pdf
[66] https://gyires.inf.unideb.hu/GyBITT/28/ch10s02.html
[67] A. Einstein, Special and General Relativity, Gondolat Budapest, 1973.