MP 12: Concepts of Physics

Time: Thursday 16:15–17:35 Location: ZHG002

MP 12.1 Thu 16:15 ZHG002

The Limits of Mathematics in Physics — •Grit Kalies[1] and Duong D. Do[2] — [1]HTWD University of Applied Sciences, Dresden, Germany — [2]The University of Queensland, Brisbane, Australia

Mathematics is considered the language of physics. Starting from idealizations and kinematics, geometric-mathematical physics emerged. By analyzing processes regarding their causes and the functional dependencies of energies, we identify shortcomings in the basic energy concepts of physics, which cannot be remedied with mathematics. While formal transformations of process equations such as integration are mathematically correct, they do conceal vital physical information, suggesting that mathematics should be used with caution. We propose a physically justified approach that reconciles the mechanical, quantum mechanical and thermodynamic energy concepts and provides a revised interpretation of E = mc^2. Our results suggest that geometric approaches were built too early on a shaky physical foundation, leading to undesirable developments in recent centuries. G. Kalies, D. D. Do, AIP Adv. 14, 115225 (2024)

MP 12.2 Thu 16:35 ZHG002

What physically characterizes the present? — •Matthias Kölbel and Werner Ahrendt — welträtsel.org

Albert Einstein was convinced that time is what you measure by a clock. According to him, the concept of 'now' has no place in physics. In fact, the physical theories available to date do not provide a comprehensive explanation why time flows and what characterizes the present in the flow of time. The phenomenon of time continues to puzzle physicists and philosophers alike.

We try to solve part of this puzzle by finding out what could physically characterize the present. To do this, we conduct a thought experiment, a modified version of the well-known twin paradox. Our thought experiment suggests that the flow of time is associated with a relative change in the magnitude of the physical quantity known as action, which occurs in the same way for all physical objects.

This consideration has several interesting consequences: Firstly, it becomes understandable why all laws of motion in physics can be derived from the principle of least action. Secondly, it leads to the unexpected conclusion that the redshift of light from distant galaxies is not due to an expansion of space, as usually assumed, but is rather due to the age of the light.

To test our hypothesis and its consequences, we propose a key experiment.

MP 12.3 Thu 16:55 ZHG002

Theoretical physics based on focal-point representation of particles. — •Osvaldo Domann — Stephanstr. 42, 85077 Manching

Physical laws describe the relations between variables as interactions. General relativity describes them as geometric relations, what makes it inappropriate for the description of gravitation and incompatible with quantum mechanics. The problem of the Standard Model in general is the very primitive static representation of subatomic particles with the energy of a resting particle concentrated in a small volume (Point-Like). This representation forces the introduction of carriers (fictitious particles) to explain interactions between them. All alternative approaches like Strings, Loops, Vortex, etc., use the same static and concentrated representation and have therefor the same problems to explain interactions. The proposed approach describes particles as focal points of rays of fundamental particles (FP) with angular momenta where the energy is stored. The four forces (electromagnetic, strong, weak and gravitation) are mathematically deduced as scalar and vector products between the angular momenta of FP. The resulting gravitation description has two force components, the Newton and an Ampere component that explains the flattening of galaxies curve. It is compatible with quantum mechanics. No dark matter is required. More at www.odomann.com

MP 12.4 Thu 17:15 ZHG002

Physikalische Grundbegriffe - relational definiert — •Martin Hohelüchter — Uni Münster/Westf.

Masse kann nur paarweise auftreten und ist daher keine Eigenschaft.

2. und 3. Newtongesetz $\mathbf{0}=m_1\mathbf{b}_1+m_2\mathbf{b}_2=\mathbf{F}_1+\mathbf{F}_2(=\mathbf{F}=m\mathbf{b})$ legen nahe: Masse ist relativ; sie basiert auf einer Relation, der Zerlegung.

Ein zerlegbarer Körper a und seine Teile a_i haben je einen Ort im 4-dim. metr. Raum. Der Ort von a ist durch die Orte der a_i darstellbar: $\mathbf{u}(a)=\Sigma k_i\mathbf{u}(a_i)$ mit $\Sigma k_i=1$

Für Dichotomien heißen die beiden Koeffizienten bei gleichen Vorzeichen je a-Massen, bei verschiedenen Vorzeichen je elektro-magnetische a-Ladungen.

Trichotomien führen analog zu Farb- bzw. schwachen (Kern)Ladungen.

Nicht Trichotomien, wohl aber Dichotomien sind iterierbar; für sie gilt das Assoziativgesetz.

Spaltung von $\mathbf{u}$ in Zeit und Raum $\mathbf{u}=(\mathbf{t},\mathbf{x})$ ergibt jeweils $(\mathbf{t},\mathbf{x}(t))=\Sigma k_i(t)(\mathbf{t},\mathbf{x}_i(t))$ mit $\Sigma k_i(t)=1$

1. Ableitung nach der Zeit führt zu

$(\mathbf{1},\mathbf{v}(t))=\Sigma k_i(t)(\mathbf{1},\mathbf{v}_i(t))$ mit

$k_i(t)\mathbf{1}=:\mathbf{e}_i(t)$ a-Energie, $k_i(t)\mathbf{v}_i(t)=:\mathbf{p}_i(t)$ a-Impuls von a_i zur Zt t.

2. Ableitung nach der Zeit ergibt

$(\mathbf{0},\mathbf{b}(t))=\Sigma k_i(t)(\mathbf{0},\mathbf{b}_i(t))$ mit $k_i(t)\mathbf{b}_i(t)=:\mathbf{F}_i(t)$a-Kraft von a_i z.Zt t

Speziell wird nicht Masse durch Kraft, sondern mech. Kraft durch Masse definiert. Die Sätze der Mechanik sind so beweisbar.

Alle Teile streben jeweils zum Ort des Ganzen. Für die Teile einer Masse-Dichotomie heißt dies Streben Gravitation.