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The Neutrinics – New Horizon of Modern Physics

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Abstract:

This article says about new perspective of Modern Physics of Elementary Particles, called neutrinos. This omnipresent particles probably could be have eminent role in birth of new technical and theoretical branches of new physical science called NEUTRINIC´S or NEUTRINICA. This new established science discipline will be touched many human activities from noninvasive medicinal diagnostics and operations to neutrino pulse-canal communication. About importance of this phenomenon is evident many large Projects all over the world and last Nobel Prize for Physics 2015, which was awarded to Takaaki Kajita from Super-Kamiokande Collaboration, University of Tokyo, Japan and Arthur B. McDonald from Sudbury Neutrino Observatory Collaboration, Queen´s University, Kingston, Canada, "for the discovery of neutrino oscillations, which shows, that neutrinos have mass". These realities can prove new horizons to our view of the whole Universe.

Keywords:

Neutrino, Neutrinica, neutrino pulse-canal communications, Super-Kamiokande, neutrino oscillations, Sudbury Neutrino Observatory, Universe.

1. Introduction

There has been a spontaneous oscillation of elementary particles of omnipresent matter on the planet Earth and in the whole Cosmos, called NEUTRINOS, observed for the last few decades.

The results in the many types of research suggest the non-zero masses of the neutrinos. Dr. Jiří Grygar says, in the appendix of Carl Sagan's Cosmos: "If the masses of neutrinos are non-zero's the whole Universe could be infinite old, boundless and not created."
The masses of all neutrinos in the Universe could be formed and caused oscillation of the Universe. The Universe could be expanded and inflated from Big Bang to Big Crunch and back every approximately 70 – 100 milliard (billion) years.

The possibility of neutrino oscillations and transformation-stabilization number in three or four types of them, according to Italian scientist Bruno Pontecorvo's (1946) research and theory, has not been eliminated until these days.

2. Main text

This phenomenon is most evident in the Physical Detection Projects like Super-Kamiokande in Japan, Dumand in Hawaii, Los Alamos in the U.S.A., CERN – GRAN SASSO in Europe, S.A.G.E. in CAUCASUS – BAKSAN in Russia, Sudbury (SNO) in Canada, AMANDA and Ice Cube in the Antarctica, NESTOR and ANTARES in Mediterranenan Sea in the South of Europe, Lake Baikal in Russia, Homestake in the South Dakota and SOUDAN (Both in the U.S.A.)

The first man, who measured the Neutrino fluxes was Raymond Davis, Jr. and John Bahcall, which defined the Solar Neutrino Unit, too.

The detection of neutrinos is not easy, through the decades many materials was tried like the detectors. It's most evident in many different geological localities of neutrino detectors and many different states of matter, that these conditions formed rock surrounding and chosen detection of scintillation medium. Very relevant is density of rocks or minerals and many significant properties like chemical composition, halftime-decay, oscillations of neutrinos, colours of detector (albedo) and radioactivity of rocks surroundings of detectors. Like a detection medium (detector) is possibly to choose many materials in many states of matter, from onefold H_2O, D_2O, NaCl, CCl_4, ^{71}Ga, ^{71}Ge, ^{100}Mo, to difficulty detection materials like $SiGe^{71}$, permafrost, $CdCl_2$, Al_2O_3, $Pb(ClO_4)_2$, Karst Water, ...

According to the author of this article and B. Pontecorvo neutrinos could have oscillated on their trajectories from the core of the Sun to underground or underwater detectors on the Earth. They had have three "flavours" or "colours" – electron neutrino ν_e, muon neutrino ν_μ and tauon neutrino ν_τ and maybe next unknown type or types of neutrinos.

Author of this article says also: "Evolution of the Modern Physics have lead to establishment of the new science discipline, respectively the new technical branch – successorist of Electronics, concretely NEUTRINICA or NEUTRINICS."

3. Applications

There are applications of Results in the laboratory and terrain (Practical) Research and Model (Theoretical) Research:

- Medicine applications – noninvasive operations and diagnostics, Neutrino laser and neutrino tomography.
- Communications (Telecommunications) – Prof. Joseph Weber: Neutrino laser – sapphire piezocrystals developed with Italian firm Pirelli crystal detector, ICT.
- Technics – Neutrino LED diode and neutrino spintronics.
- Cosmology and Astrophysics – dark matter – surface of Cosmos – Inflation Theory of Expanding Universe and inflatons.
- Radioastronomy – "tones of oscillations" and "music of the spheres"
- SETI (Searching for Extraterrestrial Intelligence) – Prof. Carl Sagan – Puerto Rico – Arecibo radiotelescope

- Neutrinos and Standard Model and GUT (Grand Unified Theory), TOE (Theory of Everything) and SUSY (Super Symmetry), SUGRA (Super Gravity Theory), Utilization of Neutrinos in "Terraforming Moon and Mars"

4. Conclusions

The goal of this article is effort to build a neutrino detector on the South Moravia in the Czech Republic in the Central Europe, with respect to rocks surroundings. This detector will be applied to many disciplines or branches of human activity and mainly for scientific research.

5. About Author

I dedicate this article to the memory of Prof. Dr. Michal Lenc, PhD. Who proved me extraordinary intuition and experience of physics.

Imrich Krištof (*1977) student of rigorous work of theoretical physics and astrophysics at the Masaryk University in Brno, Czech Republic.¨

From childhood he interests in Universe and Natural Sciences.

In 2004 he successfully passed an examination of Master´s study of Biology-Geology and Geopraphy with Diplomma work on thesis "Corrosion of strawstalactites in several caves in Moravian Karst". Through the whole time of study he collaborated with theoretical physics, Proffessors – Prof. Dr. Michal Lenc, PhD., Associate-Professor Dr. Jan Celý, CSc., Associate-Professor Dr. Miroslav Pardy, CSc., Associate Professor Dr. Petr Burcev, CSc. and Analytical Chemistry Professor Dr. Josef Havel, DrSc.

The main theme of this work is Physics of Elementary Particles and Astrophysics, concretely neutrinos (Neutrino Physics) and Geology-rocks and minerals.

The topic of author´s rigorous work is: "Rocks Surroundings of Neutrino Detectors". The goal of this work is to built the Neutrino Detector in Central Europe in Brno Region of South Moravia for scientifical and educational use in many branches of Human Activity.

6. References

[1.] C. Sagan, Cosmos, (Appendix by Dr. Jiří Grygar), 1996, Eminent Praha, 368 p.

[2.] M. Durrani, From tyres to neutrinos, New Scientist vol. 182 issue 2443-17 April 2004,

[3.] Scientific Works of Bruno Pontecorvo
http://pontecorvo.jinr.ru/work/emn.html

[4.] Super-Kamiokande – The World´s Largest Underground Neutrino Detector
www-sk.icrr.u-tokyo.ac.jp/sk/index-….

[5.] SUDBURY NEUTRINO OBSERVATORY (SNO)
www.sno.phy.queensu.ca/sno/

[6.] The Nobel Prize in Physics 2015
http://www.nobelprize.org/nobel-prizes/physics/laureates/2015/press.html