Imrich KRIŠTOF, Mgr.
imrik@atlas.cz

"The Quantum Computer Based on Lepton–neutrino Particles and other "quanticles""" by Imrich Krištof

Author: Imrich Krištof[a]

[a]Sušilova Street 774/11, 602 00 Brno, Czech Republic, South Moravia, Central Europe,

e-mail: imrik@atlas.cz

Abstract:

This publication is based on studies of The Moravian Masaryk University, Professor RNDr. Josef Havel, Dr.Sc., from Department of Analytical Chemistry and Department of Physical Electronics. The significant subject of the work is an application of ANN (ARTIFICIAL NEURAL NETWORK, with MALDI–TOF SPECTROMETRY, HPLC (High Pressure Liquid Chromatography), Electrophoresis and Research of AAS (ATOMIC ABSORPTION SPECTROSCOPY).

This text says about research of neutrinos and photons, wimp's like an application of construction of QUANTUM ANN COMPUTER. The Article consists of study an introduction of Author and Prof. RNDr. J. Havel, Dr.Sc. theme of mineralogy and biology and geography and scientific cooperation from the year 2004, study generally could be known like soil computation.

The second part of this publication is dedicated to short History of Computational Science.

The third part says about Highlights of this article, concretely Author's sketches of a quantum computer.

The fourth part talks about results from continual measuring of statistical data from project SAGE ^{37}Ar neutrino source experiment (SAGE → SOVIET–AMERICAN–^{71}GERMANIUM–^{71}GALIUM EXPERIMENT IN CAUCASCUS BAKSAN.

Fifth part is connected with METHODS (KATRIN AND TROITSK NU–MASS).

Sixth part is focused to conclusions of Research of neutrinos and other quanticles, namely photon proton, photon neutrino, neutrino photon and wimp's.

Keywords: **ANN (ARTIFICIAL NEURAL NETWORK), SPECTROMETRY, neutrino, proton, wimp's, quanticles, QUANTUM ANN COMPUTER, soil computation, SAGE (SOVIET–AMERICAN GERMANIUM–GALIUM EXPERIMENT), KATRIN (KARLSRUHE TRITIUM NEUTRINO) TROITSK NU–MASS.**

Contents:

Imrich KRIŠTOF, Mgr.
imrik@atlas.cz

1. Introduction

In years 2003–2004 Prof. RNDr. Josef Havel, Dr.Sc. helped me with my Diplomma work "Mineralogical research of strow stalactites from several caves in the Moravian Karst", when he analysed samples of soils upper horizonts to beneath about 15–45 cm from places beyond the sampling points of dripping water in the caves Punkva, Amateur Caves and Balcarka Cave and Kateřínská Cave.

These samples Prof. RNDr. Josef Havel, Dr.Sc. analyzed in MALDI–TOF SPECTROMETER AND RECOGNIZED, THAT SOIL SAMPLES AND DRIPPING WATER SAMPLES ARE VERY SIMILARLY EVEN THE ANN OF Prof. RNDr. J. Havel, DrSc. SHOWED THE VALUE OF pH, in cave solutions and vapour respectively cave's atmosphere, sensu stricto to cave's microclima can be caused by solvatation of strawstalactites in values of pH (7–8.5).

THE MOST PROBABLY IS THE FACT, THAT STRAW–STALACTITES IN THE CAVES ARE BY ORGANIC ACIDS – FULVIC AND HUMIC FROM THE VEGETATION ABOVE – WE CAN'T REMEMBER THAT SIGNIFICANT CLIMATE FACTOR IS GLOBAL CHANGE, NAMELY THE GLOBAL WARMING OF CLIMATE.

NECESSARILY IS BEHAVE TO TAKE ON OUR MINDS, THAT THE BIGGEST FACTOR OF THESE RELEVANT CHANGES IS A HUMAN AND THE MANKIND. These words beyond was connected with Prof. RNDr. J. Havel, Dr.Sc. who influenced me in my latest research.

However, let's talk something about a short History of computers.

2. History of Computational Science

200 B.C.	Greece–Antikythera's Computer showed the positions of Star–Constellation,
1920 – 1960	Hungarian mathematician John von Neumann (Princeton Advanced Studies), Project E.N.I.A.C. or G.E.N.I.A.C. KURT GÖDELL – GEORG PLACZEK (Mathematic–Logic Theories) MÖBIUS
1937	TT (Total Turing Machine) – ALAN TURING (CODE ENIGMA)
1943	WAREN McCULLOCH and WALTER PITTS created a computational model for neural network based on mathematics and algorithms called the threshold logic
1948	TURING'S B–TYPE MECHANICS
1954	WESLEY A. CLARK CALCULATORS
1958	FRANK ROSENBLATT AND TEUVO KOHONEN CREATED PERCEPTRON, ANN PERCEPTRON, NEOCOGNITRON SELF–ORGANIZATION MAPS NETWORK, KOHONEN WEBS
1958	HOPFIELD NETWORK CONNECTIONS SYSTEMS ARE A COMPUTATIONAL MODEL USED IN MACHINE LEARNING, COMPUTER SCIENCE AND OTHER RESEARCH DISCIPLINES An Artificial Neural Network IS AN INTERCONNECTED GROUP OF NODES, VAST NETWORK OF NEURON IN A BRAIN → NEURAL TURING MACHINES
1960 – 1990	DARPA U.S.A. → ARPANET → DARPANET (U.S. UNIVERSITY, M.I.T.), MASSACHUSETS INSTITUT OF TECHNOLOGY – TIMOTHY LEARY – HIGH–TECH–PSYCHEDELIC GURU

1965	Inter FAIRCHILD Semiconductors, GORDON F. MOORE'S LAW (HYPOTHESIS) FIRST PERSONAL COMPUTERS
1969	SEYMOUR PAPERT, MARVIN MINSKY AND RAY KURZWEIL, two key issues with the computational machines that processed neural networks
ENDING OF 60'S	SETI (SEARCHING FOR EXTRATERRESTRIAL INTELLIGENCE), Puerto Rico Arecibo, radiotelescope diameter 305 m,
1980	MATHEMATICIAN FIRST ADVANCED PROGRAMME FORTRAN SUPPORTS VECTOR MACHINES – NEOCOGNITRON VISUAL CORTEX BY KONIHIKO FUKUSHIMA

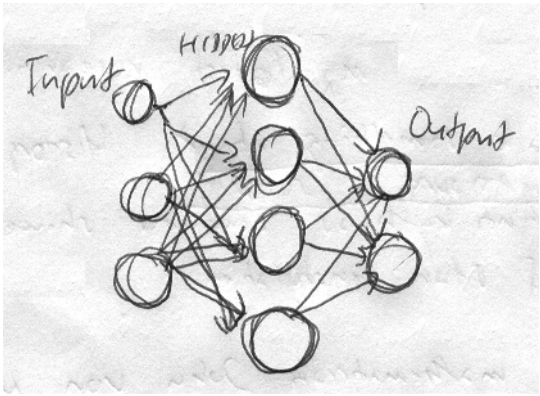

Fig. 1. Universal TURING MACHINE
(Author's sketch of the schneme of ANN).

1982	Benioff in "Quantum–mechanic hamilton models of Turing machine (Journal of Statistical Physics 29, 1982, p. 515–546)
1985	"QUANTUM THEORY Church's–Turing principle and Universal quantum Computer (Proceedings of the Royal Society of London, A 400, 1985, p. 96–117) ANN is based on a large collection of connected simple units called artificial neurons, loosely analogous to axons in biological brain.
1970–1990	BILL GATES – MICROSOFT – THE MOST KNOWN SOFTWARE OF PC MS DOS, MS OFFICE, SEATTLE, U.S.A.
1995	INTERNET (www from CERN – world wide web)
1990–2000	M. STEFFEN, L. M. K. VANDERSYPEN "EXPERIMENTAL REALIZATION OF SHORE'S FACTORIAL ALGORITHM WITH UTILIZATION OF NUCLEAR MAGNETIC RESONANCES (NATURE 414, n. 6866, 20.–27.12.2001, p.883–887) SHORE'S ALGORITHM IS DESCRIBED IN ARTICLE: "POLYNOMIAL ALGORITHMS FOR FIRSTNUMBER'S FACTORIZATION AND DISCRETE LOGARITHMS IN QUANTUM
1990–2000	COMPUTERS" STOCHASTIC NEURAL STATISTICAL NETWORKS PNN – PROBABILISTIC NEURAL NETWORKS (MONTE CARLO SAMPLING)
June 2005	G. BURKARD, D. LOSSAND, D. P. DiVincenzo IBM announced construction a BLUE GENE SUPERCOMPUTER DEDICATED TO THE SIMULATION OF A LARGE RECURRENT SPIKING NEURAL NETWORK BOND QUANTUM DOT'S LIKE QUANTUM … OF
2006	Improvements (CMOS) NEUROMORPHIC COMPUTING NANODEVICES

	CONVOLUTION CMOS DIGITAL DEVICES
	NEUROMORPHIC ENGINEERING
	TENSOR PROCESSING UNIT (TPU) OPTIMIZED
2009–2012	RECURRENT NEURAL NETWORKS MACHINE LEARNING (RNNS)
	RNNS (SUPERVISED–LEARNING)
	MULTI DIMENSIONAL LONG SHORT–TERM MEMORY (LSTM)
2012–2017	ALEX GRAVES
	OTHER TYPES OF NETWORKS
	HOLOGRAPHIC ASSOCIATIVE MEMORY (COMPLEX NUMBERS OPERATIONS)

TYPES OF ANN

- MACHINE LEARNING
  - NEURAL NETWORKS (NN)
  - PERCEPTRON
  - SUPPORT VECTOR MACHINES
  - FUZZY LOGIC (FL)
  - EVOLUTIONARY COMPUTATION (EC), including:
    - EVOLUTIONARY ALGORITHMS
    - GENETIC ALGORITHMS
    - DIFFERENTIAL EVOLUTION
- METAHEURISTIC AND SWARM INTELLIGENCE,
  - ANT COLONY OPTIMIZATION probability including:
    - Bayesian network.

3. Highlights

3.1 Quantum Superstring Artificial Neural Network

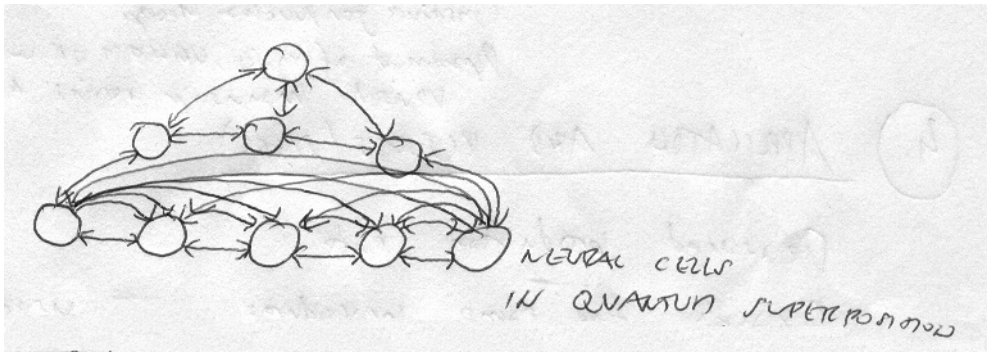

Fig. 2. Sketch of Author QUANTUM SUPERSTRING ANN RESONANCE based on E. Witten and P. Hořava superstring and Rupert Sheldrake "MORPHIC RESONANCE CONCEPT".

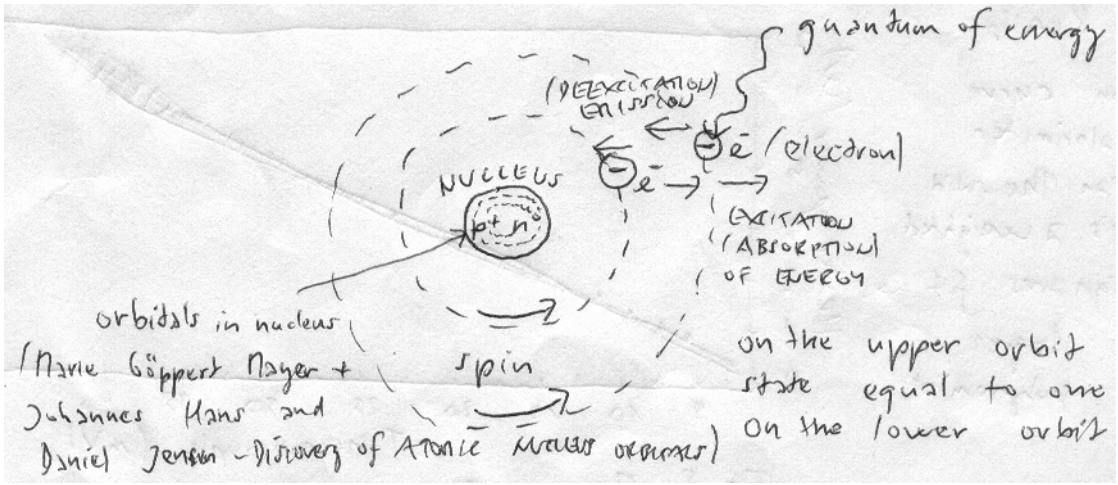

Fig. 3. ATOMIC COMPUTER BASED ON ABSORPTION (EXCITATION) AND EMISSION OF "QUANTICLE ENERGY" (Sketch of Author).

3.2 Let's look back to the one of the most known NEUTRINO PROJECT "SAGE" ^{37}Ar neutrino source experiment

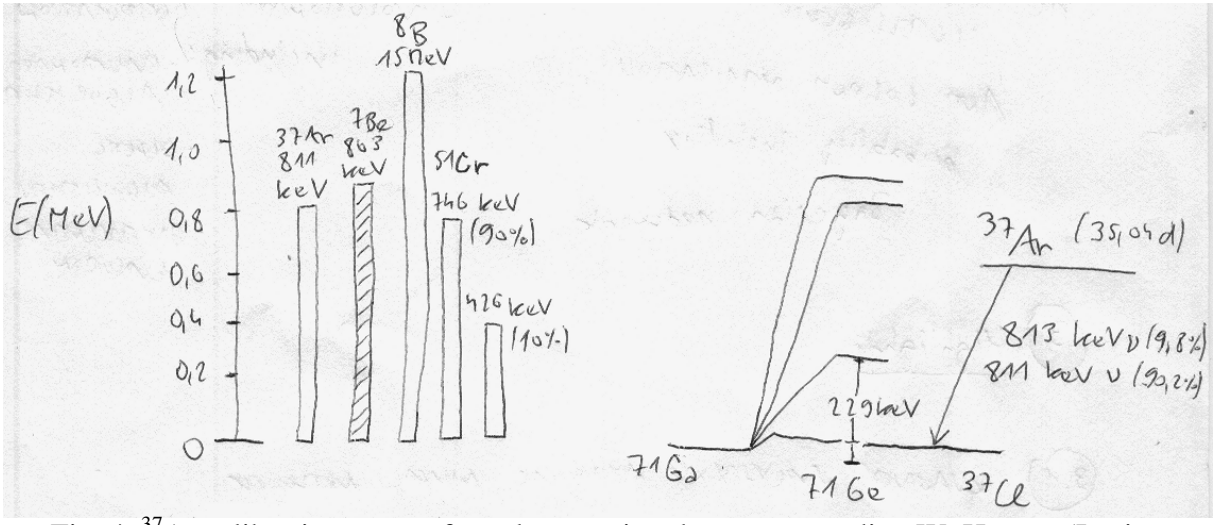

Fig. 4. ^{37}Ar calibration source for solar neutrino detector according W. Haxton (Institut for Nuclear Theory, Department of Physics, UNIVERSITY OF WASHINGTON, SEATTLE, revised manuscript received 12th September 1988).

4. Application and Results (SAGE)

Measured production rate:
Exactly the same procedures were used to extract ^{71}Ge, to measure efficiency of extraction, to select candidates ^{71}Ge events as we use fo solar neutrino runs.

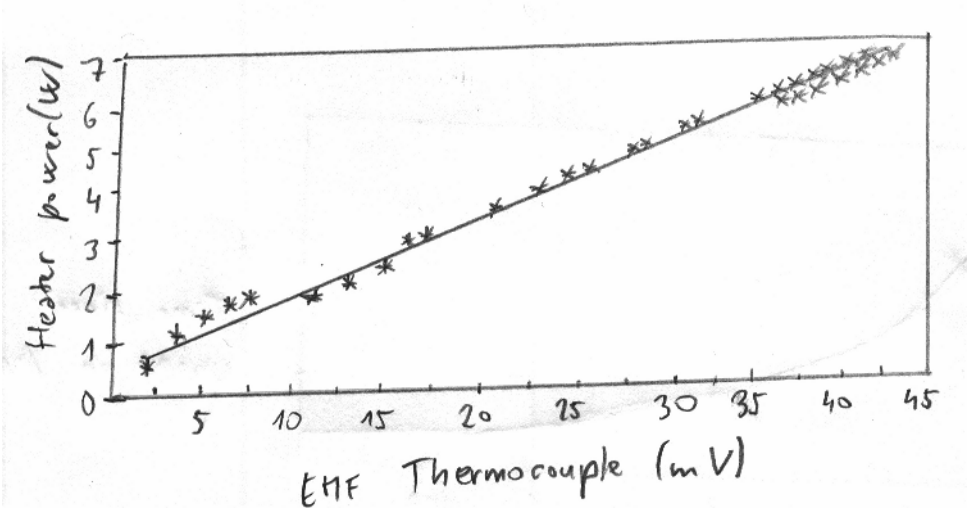

Fig. 5. Measurements at Baksan (SAGE). Results: Calibration curve of the calorimeter at Baksan. The solid curve is a weighted least squares fit to a 2nd–degree polynomial. (Sketch of Author).

$p(v) = a + bv + ca\lg ives,$

$a = 0.022 \pm 0.011\,W,$

$b = 0.1409 \pm 0.0022\ {}^{W}\!/_{m^2V}.$

The uncertainties were used as weight factors in this fit and x^2 is 19.5 with 26 degrees of freedom (probability = 81%).

Days after 04:00 on 30th April 2004	Thermocouple Voltage (mV)	Deduced power (W)	Power at 4:00 On 30th April 2004 (W)
6.55	39.601	6.04 ± 0.018	6.888 ± 0.020
14.55	34.415	5.203 ± 0.018	6.938 ± 0.024
29.55	26.024	3.878 ± 0.020	6.959 ± 0.037
44.55	19.338	2.851 ± 0.021	6.883 ± 0.051
59.54	14.290	2.093 ±0.023	6.795 ±0.074
74.55	10.490	1.531 ± 0.027	6.690 ± 0.019
89.54	7.841	1.144 ± 0.044	6.725 ± 0.261
104.54	5.928	0.867 ± 0.051	6.858 ± 0.404
119.55	4.268	0.628 ± 0.057	6.689 ± 0.610
134.55	3.189	0.474 ± 0.034	6.790 ± 0.488
140.21	2.942	0.439 ± 0.035	7.031 ± 0.567

Fig. 6. Measurement of the source power with the calorimeter at Baksan (SAGE).

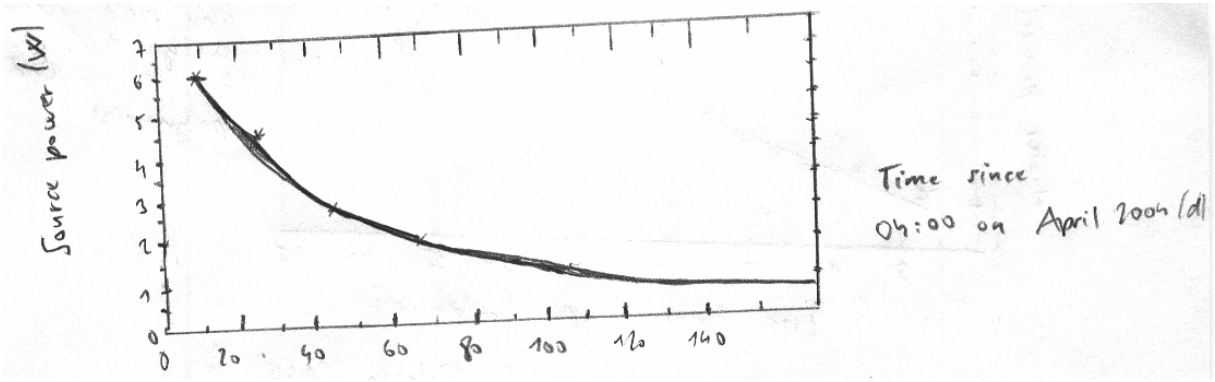

Fig. 7. Calorimeric measurement at Baksan (SAGE).

Comment: If a weighted fit is made to this data with a decaying exponential whose halflife is fixed at 35.04 d (the halflife of ^{37}Ar), then the power at the reference time is 6.907 ± 0.013 W χ^2 for this fit is 11.2 with 10 degrees of freedom (probability = 34%).
As a check, the same fit was made allowing the decay constant to be a free variable, along with the power at the reference time. The resultant best fit halflife is 34.80 ± 0.20 d, in agreement with the known value
χ^2 / DOF = 9.8/9 for this fit.
Predicted production rate:

$$p = ad\,\langle L\rangle\sigma,$$

$$\langle L\rangle = \frac{1}{4\pi V_S}\int_{absorber} dV_a \int_{source} \frac{dV_S}{r_{SA}^2},$$

$$p_{predicted} = 14.0 + 1.0/-0.4 \text{ atoms of } ^{71}\text{Ge produced per day.}$$

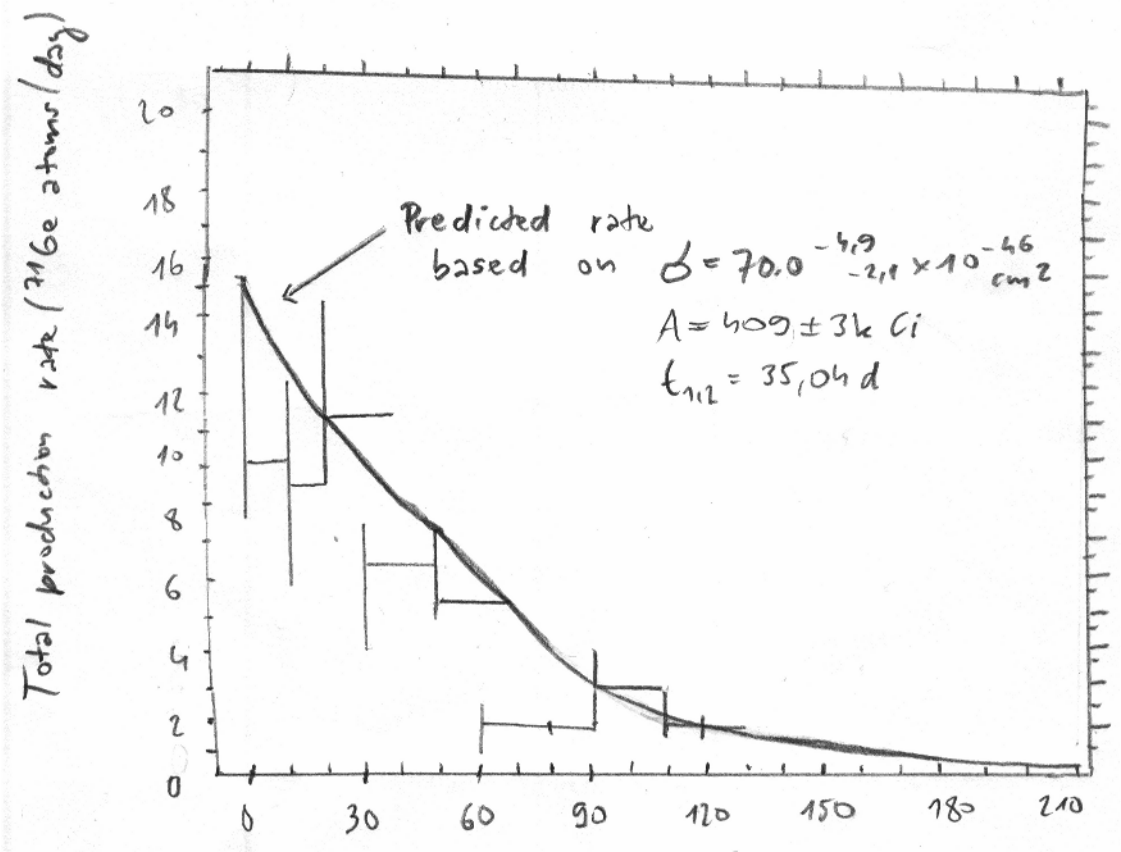

Fig. 8. Upper panel (Sketch of author). Comparison of measured total prediction rate for each extraction with predicted rate.

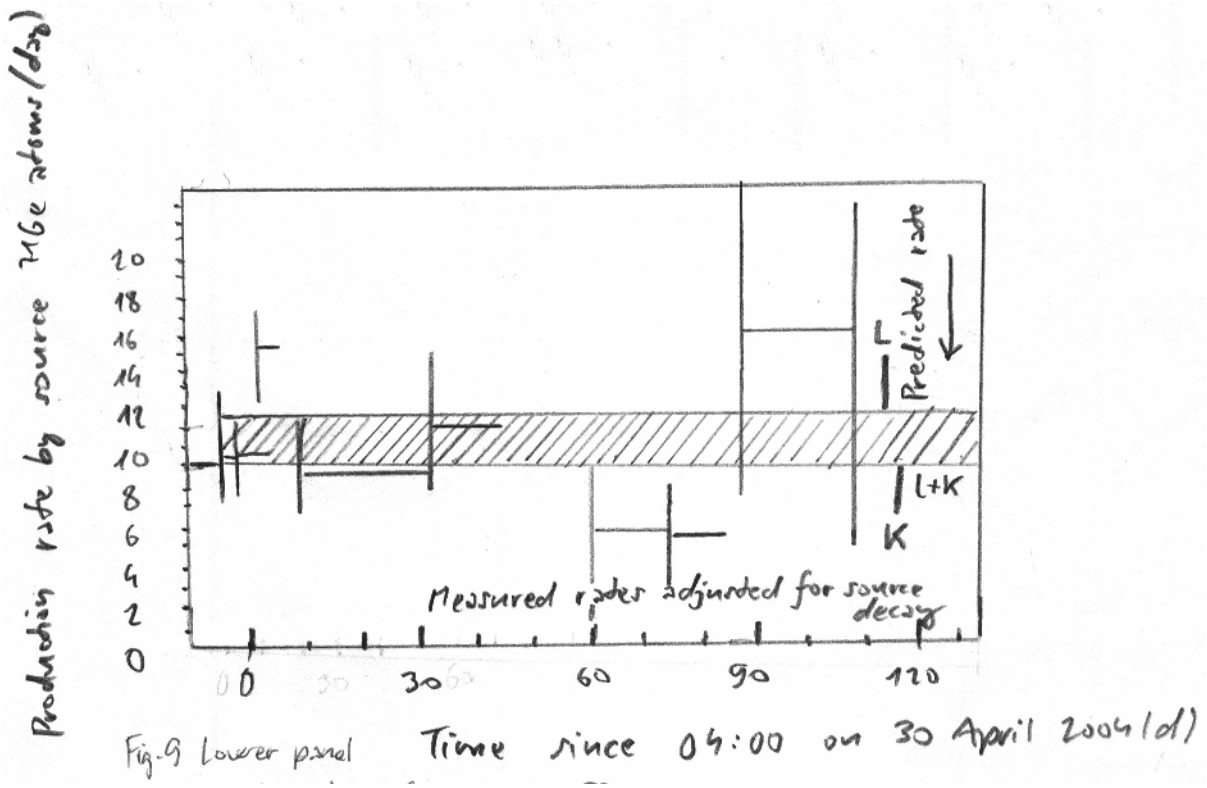

Fig. 9. Lower panel.

Measured rates from the ^{37}Ar source extrapolated back to the start of the first extraction. The combined results for events in the L– and K–peaks and for all events are shown separately at the right and compared to the predicted rate. (Author Sketch).

$$\frac{p_{measured}}{p_{predicted}} = \frac{11.0^{+1.0}_{-0.9}(stat) \pm 0.6(syst)}{14^{+1.0}_{-0.4}} = 0.79^{+0.09}_{-0.10},$$

Imrich KRIŠTOF, Mgr.
imrik@atlas.cz

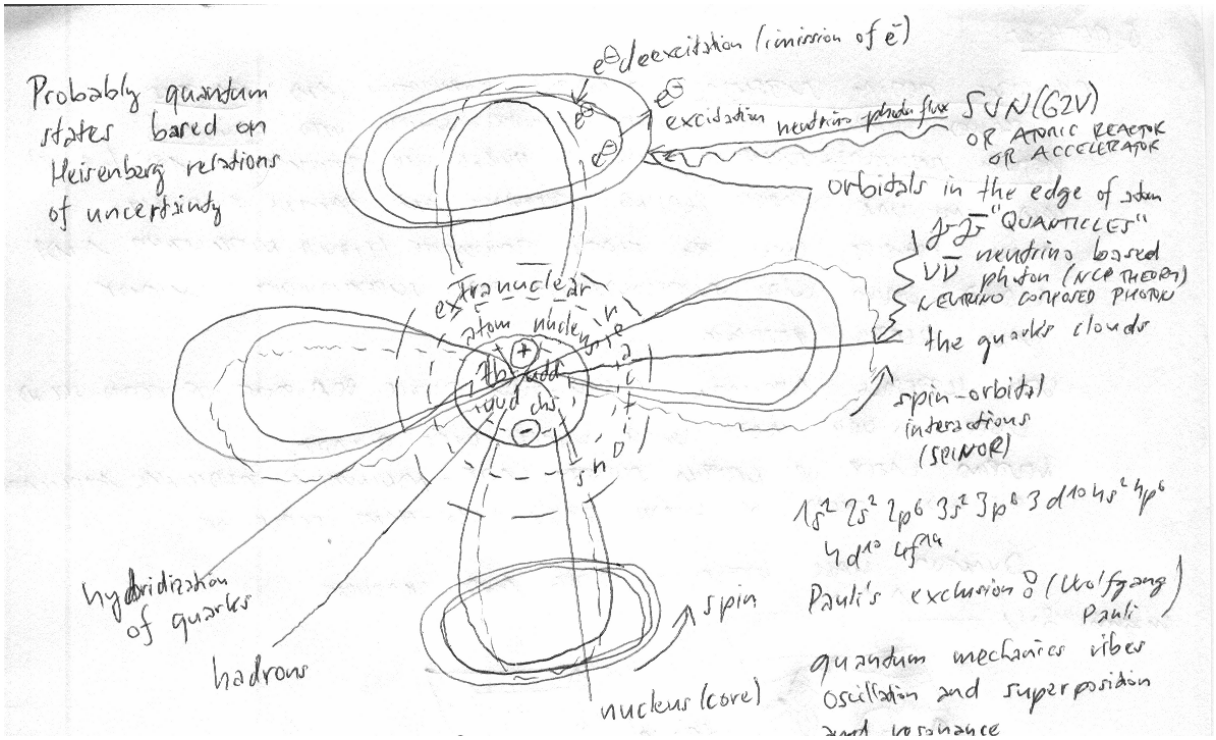

Fig. 10. The Author's sketch of quantum computer based on neutrinos or other "quanticles".

Wolfgang Ernst Pauli
Swiss physicist (25.4.1900, Vienna, 15.12.1958, Zurich). He belongs to the Theory of Relativity and quantum mechanics.
In 1945 winner of Nobel Prize for physics for the formulation of so–called Pauli's exclusion principle.

Theory: This nuclear mechanism is realized in nano–scale (10^{-9} – 10^{-10} m = 1 A^0 (Angström)). In nanochips in many cored processors of motherboard of hardware of quantum computer.
The quantum events on many cored processors will be limitation of quantum computer – it must be freezed or cold by liquid N_2 or $^4_2$He (superconductivity). Capacity – respectively reading frequency of n.q.c. (neutrino quantum computer) may be about 10^{24} (yotta) bytes/per sec. This new neutrino neural network computers, based on quantum mechanics, super artificial neural network quantum computers will be constructed → new real cosmic mind → superbioquantum ANN or WEB.
About year 2050 have had the MANKIND reach to virtual and cybernetic, maybe to really immortality → FUTURE: COMMUNICATION BETWEEN COSMIC METACIVILIZATIONS IN "WHOLE UNIVERSE".

5. Methods (KATRIN AND TROITSK NU–MASS)

CRYOGENIC MEMORY SUBSYSTEMS → MICROSOFT CORPORATION AND RAMBUS SHOWED PROJECT OF QUANTUM COMPUTER, WHICH USED CRYOGENIC MEMORY SUBSYSTEMS – SUBSYSTEMS WORKING DURING THE TEMPERATURES –180° – (–200° C) AND CAN HAVE FASTER READING FREQUENCY AND TACTING FREQUENCY, THAN MEMORIES GOING BY FLAT'S TEMPERATURE (LIQUID NITROGEN AND LIQUID HELIUM) WITH

SUPERCONDUCTIVITY AND SUPERLIQUIDITY WITHOUT ANY ELECTRIC RESISTANCE.

VERY INTERESTING APPLICATION OF HIGH–TECH SCIENCE DEVELOPMENT IS A FEMTO–SECOND LASER TO HELP PEOPLE WITH HUMAN EYE'S DISEASES.

NEUTRINO LASER OR NEUTRINO SURGERY LASER – NONINVASIVE MEDICINAL APPLICATION FOR WIDE SPREAD OF HUMAN EYE'S MICRO–NANO SCALE OF.

QUANTUM HALL EFFECT IN 2 DEG AND GRAPHENE.

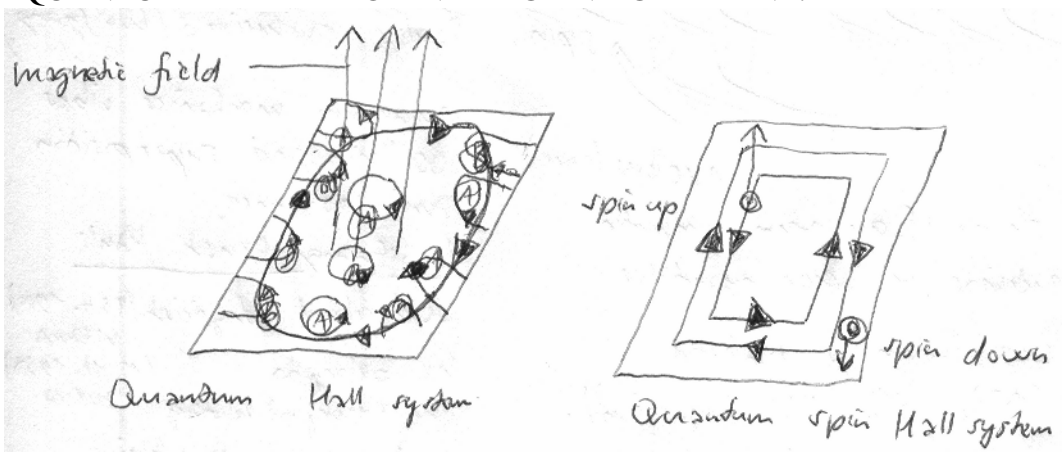

Fig. 11. Author's sketch of Quantum Hall System.

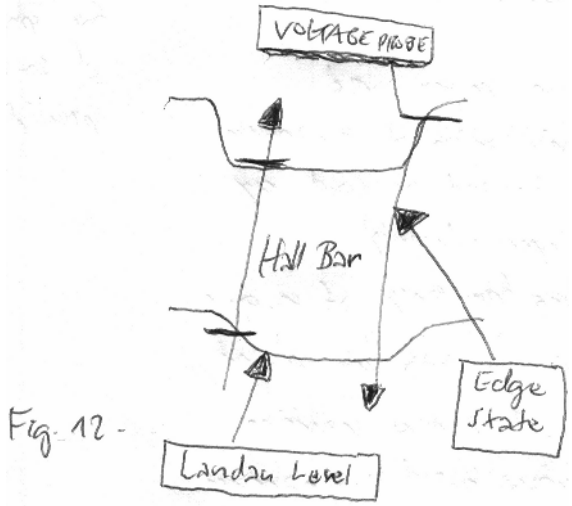

Fig. 12 -

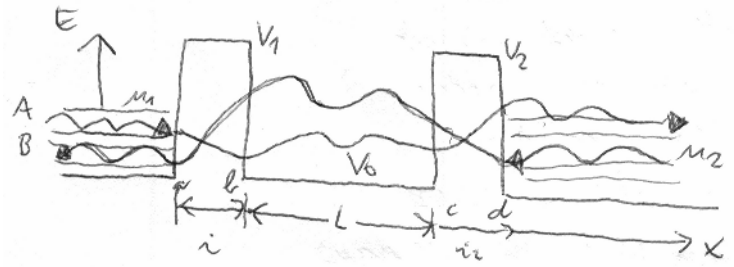

Fig. 13. Quantum Tunneling (Sketch of Author).

The MOST INTERESTING PROJECTS DURING LAST FEW DECADES ARE: TROITSK NU–MASS (NUCLEAR RESEARCH INSTITUTE TROITSK (RUSSIAN FEDERATION)) from electron to sterile neutrino, measured compounds of neutrino flux and the KATRIN (KARLSRUHE (GERMANY)), main spectrometer, measurements in Mainz and Troitsk, which yield an upper neutrino mass limit of $m_{\nu,e} < 2.3\,eV$.

Both the Mainz and Troitsk experiments consist of measurement of the tritium beta spectrum using so called integral electron spectrometers. Mainz (FORSHUNGSZENTRUM KARLSRUHE (Germany) UNIVERSITAET KARLSRUHE).

They are the instruments which combine high transmissions and good resolution.

In this project (KATRIN) participated Czech Academy of Science (Czech Republic).

This feature is indispensable for the measurement of detail shape of the β–spectrum in the endpoint region.

Both the Mainz and Troitsk experiment proved that if the neutrino rest mass is non–zero, it is less than 2.2 eV (Mainz) and 2.5 eV (Troitsk).

Further decrease of this limit is out of the possibilities of these experiments.

The KATRIN (KARLSRUHE TRITIUM NEUTRINO) experiment and prospects to search for keV–mass sterile neutrino in Tritium β–decay.

Due to the very high source luminosity, a statisticial sensitivity down to active–sterile mixing angles of $\sin^2\theta < 1\times10^{-7}\ (90\%)$ could be reached.

NEUTRINO FLAVOUR (OSCILLATION AND RESONANCE AND SUPERPOSITION) AND i the number of the mass eigenstate.

The UNITARY MATRIX U, also called Maki–Nakagawa–Sakota–Pontecorvo matrix (MNSP) can be decomposed into rotation matrices describing the mixing between the single states:

$$U = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos\theta_{23} & \sin\theta_{23} \\ 0 & -\sin\theta_{23} & \cos\theta_{23} \end{pmatrix} . \begin{pmatrix} \cos\theta_{13} & 0 & \sin\theta_{13}e^{-i\delta} \\ 0 & 1 & 0 \\ -\sin\theta_{13} & e^{-i\delta} & \cos\theta_{13} \end{pmatrix} \approx$$

$$\approx \begin{pmatrix} \cos\theta_{12} & \sin\theta_{12} & 0 \\ -\sin\theta_{12} & \cos\theta_{12} & 0 \\ 0 & 0 & 1 \end{pmatrix} . \begin{pmatrix} e^{\cos i2} & 0 & 0 \\ 0 & e^{\cos i2} & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

6. Conclusions

The strategic focus of the future decades will be an interesting way to the whole parts of modern physics, to the QUANTUM MECHANICS, The High Energy Particle Physics, Nuclear Physics, and Analytical and Theoretical Physics.

These most important discoveries in the future could have lead to micro–quantum computer based on elementary particles, called neutrinos and other quanticles.

These new quantum computer will be near to many discoveries into the branches of physics like for example Neutrinics and Spin–tronics and Neutrino Nanophysics and Stellar Neutrino Physics.

7. Acknowledgements

MANY THANKS TO MY MOTHER YVONNE KRIŠTOFOVÁ FOR HER PATIENCE AND LOVEFULL SUPPORT.

I also wish to thank Prof. RNDr. Josef Havel, Dr.Sc. from Department of Analytical Chemistry, MU Brno, Czech Republic and Prof. RNDr. Eduard Schmidt, CSc. (Department of Condensed Matter, MU Brno, Czech Republic) and Associate Prof. RNDr. Jan Celý, CSc. for their rich – valuable time for teaching and study many and many enthusiastic young physicists, which illuminated much more and more density hazed clouds on the clear blue scientific sky.

I wish to thank to Prof. RNDr. Jana Musilová, CSc. for her expert information and enthusiasm and continuous support for the “Rocks Surroundings of Neutrino Detectors“ Project.

MANY THANKS TO Ing. Josef Pokorný, IT specialist and postgraduate student at BRNO UNIVERSITYOF TECHOLOGY for his patience and structural and scientifical helpful support, to creation of this article.

8. References

[1.] A. Hodges, ALAN TURING: THE ENIGMA (Walker) (2000), http://www.turing.org.uk/index.html, http://www.computercollector.com/archive/geniac/.

[2.] A. Nozik, Investigation of neutrino properties in Troitsk (2012), 20p.

[3.] G. Johnson, A Shortent Through Time. The Path to the Quantum Computer (2000) Dokořán Argo, Praha, 235p.

[4.] K. A. Hugenberk, Diplommsarbeit in Physik – Design of the electrode system for the KATRIN main spectrometer (2008), Institut für Kernphysik, Universität Münster, 159p.

[5.] R. Feynman, QED: The Strange Theory of Light and Matter (1985), Princeton University Press.

[6.] V. N. Gavrin, PRESENT STATUS OF THE SAGE ^{37}Ar neutrino source experiment SAGE BNO INR RAS 11th International Workshop on: ”NEUTRINO TELESCOPES”, Venice 2005, 37p.