

**Wandering Towards a Goal**  
**How can mindless mathematical laws give rise to aims and intention?**

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Bio.

I am Emeritus Professor , Warsaw University, Warsaw , Poland. At the beginning my work in physics I was engaged in the study of high energy nuclear reactions, next relativistic heavy ion reactions ( JINR- Dubna, PSI Villigen and CERN) and ultra- high intensity laser induced phenomena. In those fields I published above 200 papers and 6 monographs in USA and Germany. Recently I started the investigations of the physics of human brain and cancer. All my papers ( published) and scientific projects I am involved can be find out on Research Gate

# Wandering with the Wind

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Abstract.

In this essay we, based on the real physicist experience in nuclear physics research, present the evident influence of the second reality on the work of physicist.

*It is better to be too bold than to timid in extrapolating our knowledge from the  
known into the unknown*  
Freeman Dyson, Time without end, 1979

. After my eighty rounds round the Sun I am critically realistic: there is the second reality to which scientists can approach sometimes, somewhere. Laws of mathematics are the candles which we hold in our shuddered hands. With light we go to LIGHT (Frossard). Guided by intuition we wanderer seeing the hazy panorama of physical phenomena and vague relations.

My own experience is from nuclear physics. In late eighties with my colleagues from Physics Institute in Zurich and Paul Scherrer Institute in Willigen (Switzerland) we start the investigation of nuclear *continuum* with (p, alpha..) reaction on light nuclei. In nuclear physics “continuum” means excitation energy well above 8-9 MeV. As an example let us consider the reaction [1]



On Fig 1 we present energy levels of  ${}^9\text{Be}^*$  nucleus

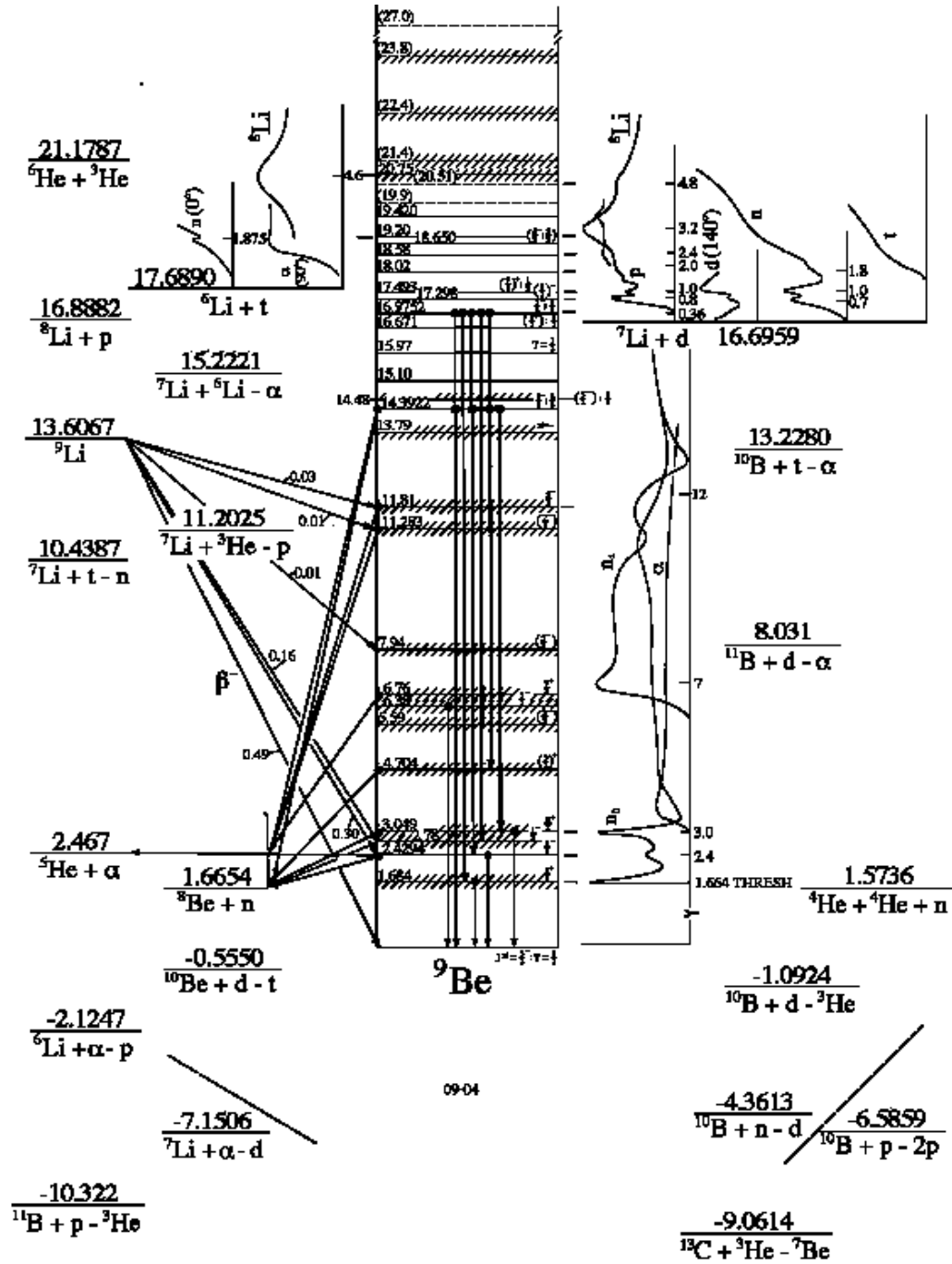


Fig.1 Energy levels of  ${}^9\text{Be}$  nucleus up to 25 MeV excitation energy.

As it is easily seen in the vicinity of excitation energy  $E > 19$  MeV there are a few shaded levels quite different from lower energy levels.

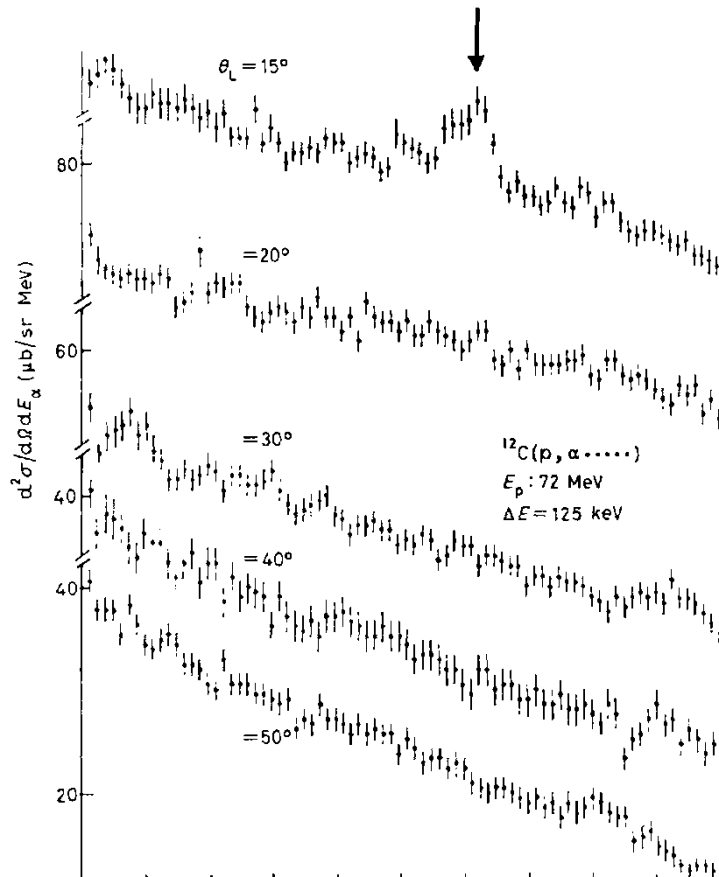


Fig.2 Excitation energy of the  ${}^9\text{Be}^*$  nucleus observed in our work. Range of excitation 15 to 30 MeV ( from right to left ) in  ${}^{12}\text{C}(\text{p},\alpha,\dots)$  reaction  $E_p=72$  MeV.

In Fig 2. we present our measurement [Kozłowski et al, 1981]. At first sight we see that experimental spectra observed in another reactions ( Fig.1) and in our work are quite different. Our spectra are quite „empty” excluding a „bump” at  $E=20$  MeV. Why? In our research group were 6 physicist 5 experimentalist with great experimental experience and one theoretician ( Me). Reasonable experimentalist say at once: *contamination*. It means what we observed was the trace of another intruder nucleus which per accident we „discover” in target  ${}^{12}\text{C}$ . From pure experimental point of view they were right. For if in nuclear level tables we do not observed the excited “bump”, so why we were so clever and find the „true new physics”. Moreover from theoretical point of view I do know ( in that old time, 25 years ago) the model calculations for so high excited pronounced level

In one of the August Saturday 1980 I was in Physics Institute in Zurich. Physics Institute was located in that time at *Schonbergasse 9*. Through the window of my office I saw the

Zurich lake all in Sun light and buildings of Old Zurich Town ( XVI-XVII c) As an inviting dozent I lived near by Institute in Bodmer Haus ( XVII c) with Thomas Mann Archive as my neighbour.. In my office wandering through Nuclear Levels Table ( very intersting job!) I lost all enthusiasm to  ${}^9\text{Be}$  nucleus and go for lunch to Old Town restaurant. Aftnoon of that day was rather a windy day. Rather pesimistic I came back to office and sat at the table with open „Table of nuclear levels.” I looked in it and realized that wind changed the pages of Table. What I saw was presented of Fig3 !!!!

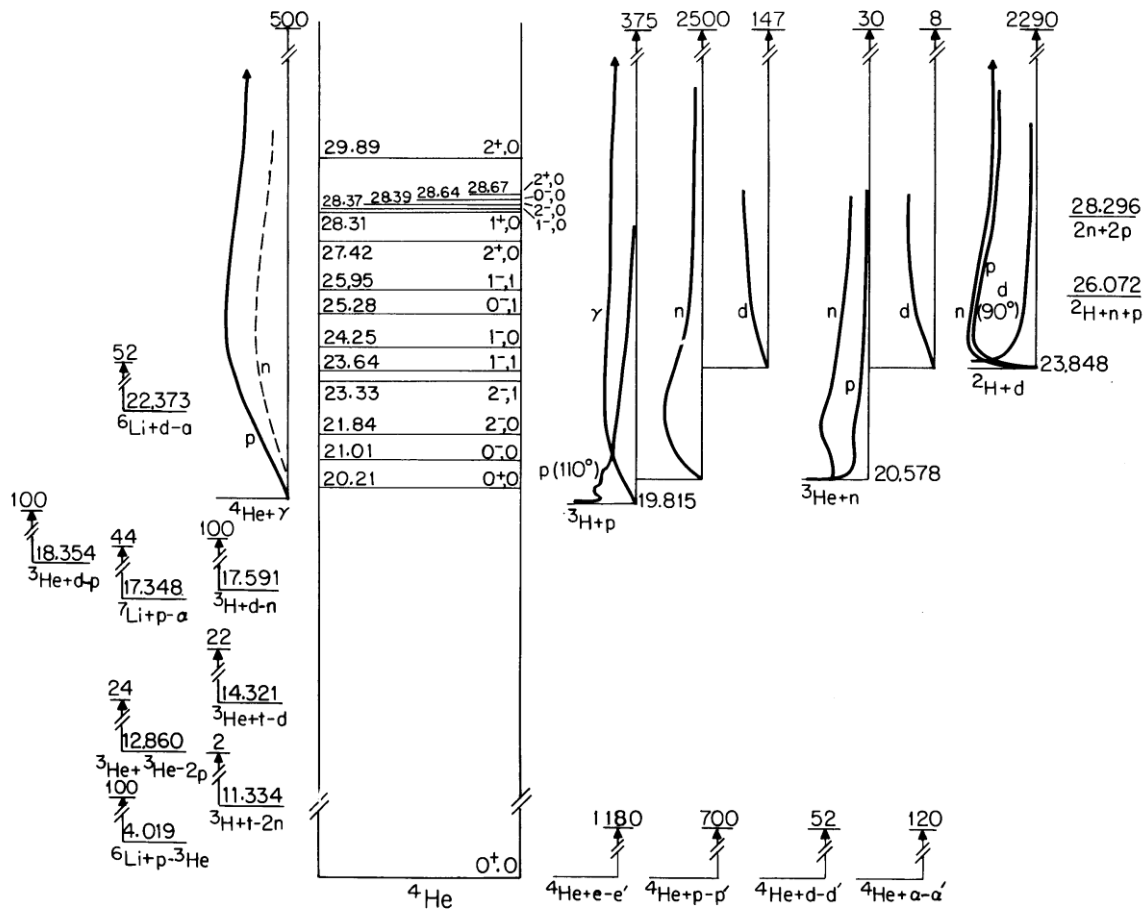


Fig.3. Energy levels of excited alpha particle.!!!!“

Can you imagine my happiness. From all of light nuclei only excited alpha particle is „naked” up to 20 MeV. Rest story with physics was rather obvious. What we observed was excited alpha particle inside  ${}^9\text{Be}$  nucleus.

*We discovered new type of light excited nuclei with excited alpha particle inside. This nuclei are unstable, with emission of p and t.*

To the point.

Our consciousness is a part of Universe. Mathematics and physics are in the edge of consciousness. All is One and One is in All. No other explanations are needed.

#### Reference

M.Kozłowski, H H Muller, P. Schober,, Z.Lewandowski, E Loeffler, R.Wagne  
Structure in the Continuum alpha Particle Spectra of the (p,alpha,x...) Reaction on  ${}^{12}\text{C}$  and  ${}^{27}\text{Al}$ , *Lettere al. Nuovo Cimento*, vol 31 ( 1981), p.565