I don’t know what I seem be to the world,  
But to myself I seem to be a little boy picking up  
beautiful stones on the shore while there is a whole  
ocean around that needs to be unexplored.  

I. Newton

Receiving a gift from the Nature is not enough.  
The people who have achieved considerable heights in science would originally start  
their way into the unexplored world from the initial push. Some came to science accidentally;  
others were brought to it by something that will remain a mystery forever. For the majority,  
however, their search of the Truth and Harmony began from the inspiring word by their  
Teacher.

Evgenii Petrovich Pokatilov belongs to the generation of those who came to higher edu-  
cation immediately after the war. Driven by their thirst of knowledge and faith in the future,  
they swiftly rushed into science. This generation entered the History as a generation of Ma-  
kers and Creators. The grand rise of science in the 60s – 70s is the fruit of their creation.  
Such were the first graduates of the State University in Chisinau and Evgenii Petrovich  
was one of the best.

His researching abilities, like the abilities of many of his colleagues who came to be  
famous scientists, were noticed back in their student years. The choice made by him then was  
the lucky and only one for the rest of his life. Evgenii Petrovich did not only make his way  
into science, he became an outstanding theoretical physicist who made major discoveries and  
started new trends in science.

He established his own scientific school. His disciples – several dozens of doctors in  
science and doctors habilitate – have already left their traces in science and today work suc-  
cessfully in various spheres of physics in different countries of the world.

Thousands of university students have had chance to witness his self-sacrificing, altruis-  
tic devotion to physics, to enjoy his pedagogical Talent, to experience the charm of his per-  
sonality.

His attitude to scientific creation, his ideals and principles grew up under unfavourable  
conditions. Life in the country was hard and the young generation was going through the con-  
sequences of one of the most terrible wars in the history of mankind, through hunger, destruc-  
tion, scarce material supply of the post-war time.

His love of science, however, his optimism, zeal, outstanding industriousness proved to  
be stronger than all the trials and hardships.

In Chisinau, where there had never been scientific centers for physics, physical schools  
began to appear. Like the bright stars in the skies of science, the following names began to  
shine: Yury Evgenievich Perlin, the brothers Svyatoslav and Vsevolod Moskalenko, Victor  
Kovarsky, Evgenii Pokatilov… Their achievements in science made Moldova known all over  
the world.
They had an excellent scientific reputation and remarkable personal traits, which played the main role in attracting talented young people to physics. Each of them had his own unique work style.

At that time I was a third-year student and Evgenii Petrovich was my course paper advisor. I was conquered by his remarkable ability to speak simply and clearly about complicated things, by his talent to model physical patterns “with his fingers”, hardly ever employing sophisticated mathematics for estimating final results. Later on, I found out that this combination of traits was laconically outlined in the Willer’s rule: “A good physician must not start a mathematical problem if he does not know exactly its final result with an accuracy to an order”.

Evgenii Petrovich would never press his young colleagues with his authoritative reputation. When the first joined scientific work was born in donor – acceptor Auger-radiation recombination in semiconductors, I could experience the feeling of a beginning mountaineer who had climbed up his first ever mountain. This feeling of the magic of height and the newly opened horizon grew on when I came to be Pokatilov’s post-graduate student and I had the doors of his creative workshop open in front of me. “Tortures of creation” are likely to cause complexes in beginners, to which I was no exception. But when you have a Master beside you, who has an excellent flair for interesting problems, this process has much chance to be completed successfully.

The simple problem of the potential of image forces in the contact of two polar crystals gave birth to the theory of surface polarons and the answer to the question as to the area of application for the classical result known from the textbooks in electrical dynamics proved to be an individual case in the theory made by us, just like the quantum theory of the image potential itself appeared to be no more than one of the steps in the general theory of surface polarons. The search of the answer to this question brought us to a broader model of the Toezava’s electrical polaron in the case of semi-restricted quantum dielectric, which later resulted in the research of the criteria for localization of the free charge carriers in the field of the image quantum potential. Thus, one single question formulated in the right way could cause the chain reaction of getting more and more new problems born, which still continues. According to R. Feynman who could see “the reflection of the whole Nature in a drop of Champaign”, this ability could only be possessed by someone who could understand the Creator’s language and intentions.

Another surprising fact was that all the strict results we had in this problem would only add to and lay out the picture “drafted” by Evgenii Petrovich long before the general theory was formulated. His model of surface polaron “drawn” intuitionally in the way of a charged sphere split by a plane and “stuck” to the crystal surface proved to be “smarter” and more convincing than all the formulae and mathematical solutions offered to the creator of the polaron theory Solomon Isaakovitch Pekar at the physics seminar in the Institute of Semiconductors in Ukraine. The luminary looked at the pictures, thought for a while, and said, “This theory has the right to be”.

The effect of Evgenii Petrovich’s pedagogical talent was spread to reach his every student. The doors of his creative workshop are still open for everyone who is in love with science. He has never seen competitors in his students and has always generously shared his own results with them.

Evgenii Petrovich has achieved so much in science owing to the fortunate tangle of his deepest erudition and creative energy.

One of his most beautiful early works dealt with introducing into the solid-state physics of a new quasi-particle – piezopolaron. This work made him famous among physicists and
gave life to the new scientific direction. Whereas piezopolaron, after it was experimentally discovered by American and Japanese physicists in the spectra of absorption of the high-frequency electrical fields in piezocrystals, moved from Pokatilov’s scientific articles into the university course books for students of physics. One more new direction was the research of non-linear kinetic phenomena in semiconductors based on the Feynman’s method of integrals in trajectories.

Evgenii Petrovich personally developed and taught us a special course in Feynman’s variant of quantum mechanics. Simultaneously, he applied this method to solving the problem of absorption of strong laser radiation in crystals. For a long time this problem did not yield to solution in the frames of standard theory. The Feynman’s method made it possible to overcome the nontrivial difficulties. The brilliant results achieved by Evgenii Petrovich were published in one of the most prestigious scientific journals “Physics Reports” (Belgium 1988) and had worldwide recognition.

Considerable achievements in new technologies for growing multi–layer semiconducting structures (molecular – beam epitaxy) and in the physics of high vacuum ($10^{-11}$ to $10^{-12}$ mm Hg) in the 80s of the last century stimulated rapid growth of a new direction in the solid-state electronics. Modeling of the band structure in multi–layer systems became possible. The technological progress was preceded by theoretical research in the properties of multi–layer systems. The word “superlattice” itself for multi–layer periodical system was introduced in physics by theoreticians, who described its unusual electronic, optical and other properties long before it was created by the experimentalists.

An important direction in this new area was started by the research in the phonon spectrum of multi–layer systems, the problem of electron – phonon interaction. In particular, while describing electron (hole) states, exciton states according to Vanier – Mott theoreticians would, as a rule, use model Hamiltonians with phenomenological parameters. Basing on the solution to the Poisson’s equation for optional multi–layer structures, Evgenii Petrovich together with his students managed to build an exact Hamiltonian of electron – phonon interaction of Froehlich’s kind, which enabled gradual solutions to the problems of polaron, Vanier – Mott’s exciton, bi-exciton, bipolaron in planar multi–layer structures. The suggested idea of segregating the particles and polarizations binding them later developed to be a harmonious bi-polaron theory making it possible to look at the problem of high-temperature superconductivity in a different way. For the first time a full classification was made in vibrational excitations for optional multi–layer structures, which contain semiconducting and dielectric layers. For an individual case of compositional superlattices formed by alternation of polar semiconductors, the works by Pokatilov, Beril (1981 – 1982 Phys. Stat. Sol.) predicted the existence of new elementary excitations – surface space-extensive phonon polaritons. In 1985 the fact of their existence was experimentally proved by Manuel Kardona, the Nobel Prize laureate from Max – Plank Institute, Stuttgart, FRG with reference to the priority of the work by E.P. Pokatilov and S.I. Beril.

In 1999, the International Association of Scientific Discoveries Authors registered the scientific discovery “Phenomenon of spreading of space-extensive phonon polarons in compositional lattices” # 119. Priority of 03. 11. 1981. Authors: E.P. Pokatilov, S.I. Beril, V.M. Fomin

Existence of these elementary excitations with the reference to the priority of the works by E.P. Pokatilov, S.I. Beril and V.M. Fomin was confirmed in the laboratories of the USA, Canada, England, France, Germany, Japan, etc. There are about 200 references to these works in the world’s scientific periodical literature today.
It should be noted that this discovery initiated the new direction in experimental physics – Raman spectroscopy of the super-grates and it underlay the applied methods of controlling the quality and properties of compositional super-grates.

In 1990 the publishing house Shtiintsa released the monographic work of E.P. Pokatilov, S.I. Beril and V.M. Fomin “Vibrational excitations, polarons and excitons in multi–layer structures and superlattices”, where the authors summarized all the individual results on electron-photon interaction, surface polarons and excitons in the quantum semiconducting films and multi–layer structures with quantum wells. For the first time successive descriptions were given to the effects of self-influence and the polaron effects in optical spectra of multi–layer structures. These works became the basis for interpreting the experiments carried out in the Lebedev Physical Institute, USSR Academy of Sciences, Ioffe Institute of Physics and Technology, USSR Academy of Sciences, Institute of Semiconductors, Academy of Sciences in Ukraine, etc. and they were recognized by specialists in this sphere.

The next step in researching the multi–layer structures was a transition from the planar structures to those of cylindrical (multi–layer quantum wires) and spherical (multi–layer quantum dots) geometry. The topical importance of these researches was evident, for by that time, they had already been widely used as objects of experimental study.

The breadth of E.P. Pokatilov’s interests was most brightly reflected in the applied works on developing essentially new devices for processing optical signals and images: spatial-temporal modulators of light for various spectral ranges. Evgenii Petrovich established and headed the applied scientific laboratory “Photon”, developed the original theory of electrical-optical transducers and made experimental samples and working models of these extremely perspective devices in modern optoelectronics.

The results of his many-sided activities as a physical theorist and head of applied works were highly appraised by competent specialists.

E.P. Pokatilov’s achievements in science were rewarded by the State prize of the Moldavian Soviet Socialist Republic. He was elected an Associate Member of the Academy of Sciences of Moldova (1988) and a full member of the Russian Academy of Natural Sciences (2003).

E.P. Pokatilov’s scientific productivity and creative longevity, his exceptionally high creative energy are much delighted. Over 400 scientific works, several dozens of inventions, major discoveries, reviews in the most prestigious scientific journals, monographs, thousands of lectures given in almost all disciplines in physics, a dozen of doctoral students successfully developing the ideas of their Teacher, hundreds of presentations at international scientific conferences, symposia, schools; a widest geography of scientific connections and cooperation! An enviable fate worth of admiration.

Science will always have an acute demand for such outstanding people as Evgenii Petrovich Pokatilov. These people are those who suggest new ideas, create new mathematical apparatus for physics and invent new methods for solving difficult problems of science.

They are the ones who “pick up the beautiful stones on the shore of the Unexplored Ocean”, who possess the gift of seeing the future of science and creating new physical images of the world.