

This interview was conducted by Sergius Kishenko, Moscow Russia. This article and photograph are appearing in Super New Reality magazine as the feature article of the June 2008 issue. The Russian version has additional photographs and footnotes.

Sverkhnovaya Realnost ("SuperNew Reality") Magazine – Moscow Russia

### **Interview with EU Nanotechnology Executive**

The feature article today is an interview with Karl W B Schwarz, the Managing Director, CEO of a United States nanotechnology company that has relocated its operations to Vienna Austria. That company will soon break ground on the world's largest carbon nanostructures production facility in Slovakia and a major new Nanotechnology R&D Facility in Austria.

S.K. Hello Mr. Schwarz, what exactly does Rokkors Nanotechnologies GmbH produce and how is that applied to new nanotechnology products?

K.S. We produce what are called generically CNS, or carbon nanostructures. That includes single wall nanotubes, or SWNT, double wall nanotubes (DWNT), multi-wall nanotubes (MWNT), carbon nanofibers (CNF) and hollow carbon spheres designated as C60, C80, C120 and C160. We have proprietary process machines that make these tiny nanostructures in very large volumes. The nanomachines are a key piece of getting this done. There are few nations that have the base and skills that could build that— US, Canada, Germany, Switzerland, Austria, China, Korea, Japan and Russia.

As to new products, what we do is applied to new types of nanofilters, nanosensors, aerospace and automotive applications, energy, environmental, medical, nanopharma, etc. Virtually every major industry you can think of today is being impacted by the science we are involved in and those affects will increase in coming years.

S.K. Interesting, what is the main difference between your process and that of your competitors?

K.S. Most of our competitors produce pre-washed, or pre-cleaned in the range of 35%-50% purity, some a little higher. We produce pre-cleaned carbon nanostructures that are 80%-85% pure. After the competition cleans their production output, they reach 70% to 80% nominal purity, we reach >95% to >99.5% purity and the morphology of our finished product is much better than the competition.

Many of them produce grams to pounds per day of product that is greatly inferior to our output, and we will be producing 4,000 metric tons a month at full capacity, 48,000 metric tons per year. Our target over 5 years through expansion of capacity in other nations is 30,000 to 36,000 metric tons per month.

S.K. What does that mean in laymen's terms as to how purity and morphology are important?

K.S. Morphology is a way of describing the integrity of the crystalline structure, strength, uniformity, etc. It is much more involved than that, but that is a laymen's explanation of how to look at it. The purity levels are very important because at low purity producers can only offer carbon nanostructures that can change the porosity or density of a material that is compatible with carbon nanostructures. At low purity there are no significant scientific properties other than scale or size of the particles. When the purity and morphology of a carbon nanotube are very poor, the nanostructure is dysfunctional and cannot do what is possible at the higher purity levels. What is possible scientifically is negated by poor purity, poor morphology.

S.K. How does that affect the development of new products, new advancements using carbon nanostructures?

K.S. Several examples. Carbon nanostructures are building blocks. In that I mean they are not a finished product that you can go into a store to purchase and do anything with them. Highly pure carbon nanotubes have remarkable properties and we make finished products from those that no other competitor can make with the lower purity. Our value chain from lab to industrial output to finished product is very different from our competition.

S.K. What types of products for example?

K.S. We make nanofilters that can be used in medical, industrial process gasses, air and water purification, environmental applications, and what we make can do things scientifically that the competition has not figured out yet how to do. Our nanofilters do not stop small particles due solely to porosity or filter density. They can also be specifically engineered to stop specific particles. We purify all of the input gasses we use to levels that are not possible by other types of gas purification processes. In fact, we use a type of those nanofilters to reach the purity levels our competitors have not been able to reach.

S.K. So, to reach the levels you have achieved it is multiple levels of technology working in unison? Is that accurate?

K.S. That is correct. It is our machines, our nanofilters, and some internal procedures and materials that we keep proprietary. All three combined equal what the intellectual property attorneys call an Industrial Process Patent and is virtually impossible to compete with, without infringing on our patents. There is also an additional dynamic of cost per unit or cost per kilogram. Our process is the absolute leader in producing CNS at reasonable cost, high purity, high morphology and volume of output. We have an economy of scale that they do not have and output is a vastly superior product that has properties that lower purity CNS do not have.

S.K. What other types of products will be made from the high purity carbon nanostructures you make?

K.S. Hydrogen Power Systems that can power cars, trucks, tractors, homes, remote power needs. Cosmetics that have some remarkable properties including anti-aging, natural iridescence, skin cancer treatment, etc. Nanosensors that can detect spoiled food, or detect pathogens that can make a person very ill or, in some instances, kill due to resistance to antibiotics. New ways of fighting diseases and chronic conditions. New types of carbon composites that are stronger than virtually any type of metal and have properties that metals do not have.

S.K. This all sounds like very high level science. How do you describe this science and its possibilities to say bankers, investors, regulators, or government people, or media people?

K.S. It is very high level and many PhD scientists I have met with do not do this science well while others are nothing short of visionary in what they have accomplished. Nanotechnology is the manipulation of matter at under 100 nanometers in scale, with a nanometer being one-billionth of a meter. The average human virus is about 300nm, the average human hair is about 80,000 nanometers thick, so the scale is much smaller than the human eye can see and in most instances even smaller than a human virus. It takes very powerful electron microscopes to see this science at work.

The sheer scale of it is hard to imagine or visualize. When I meet with such people and they ask a similar question this is basically how I address it and many begin see it clearly.

Nanotechnology is the next logical step of mankind in our understanding and application of higher level mathematics, physics, quantum mechanics, chemistry, medicine, energy, environmental applications, etc. What we have today are very inefficient, polluting and wasteful processes. Nanotechnology is forcing mankind to be more efficient in thinking and more efficient in production. Even the concepts of input and output are going through some landmark changes.

S.K. Out of curiosity, how did you get into nanotechnology and wind up being the CEO of a fast growing leader in this new area of technology?

K.S. I am trained as an architect / engineer, which requires large scale three dimensional thinking. That can also be applied to any scale if one has the mind to grasp it. Being able to think three-dimensionally at nano-scale is the reverse, or the opposite, of trying to imagine the scale of the universe. It is all a matter of scale but is still three dimensional thinking and visualization. It is a gift from God that you cannot go to any university to learn. Three dimensional thinking skills help me to guide my company at all levels including production, nanomachines, research and development, commercialization of products, etc.

I also have 12 years of experience on Wall Street, the US capital markets, so project finance of large scale ventures or strategic execution of a business plan are something I am very accustomed to doing.

S.K. Many consider the United States the ultimate market to be in due to the size of the economy. Why did you, as a US citizen, decide to move your company to Austria?

K.S. The US system is dominated by the major corporations and entrepreneurial efforts are quashed (or blocked) if they are stepping on the wrong toes. Our process is years ahead of any known competitor. We have met with many of the corporate giants and they are not at the level we are. The US is also lagging way behind the EU and China in commercialization of nanotechnology. Research is valuable but if one cannot commercialize it, it is not that valuable. We relocated to the EU to commercialize and also to make sure that this science is available to all of mankind and not under the control of major US corporations.

S.K. You seem to have a world view regarding this science that goes far beyond the typical US policies that foreigners are accustomed to. Can you state why because you do not sound like the typical American technology executive.

K.S. I guess in a way I am not a typical American. I have had the discussions with some policy makers in America and they think they can rule the world with intellectual property and outsource production to cheap labor markets. That might work for making mass consumer goods for WalMart or Target Stores but that is not going to cut it in nanotechnology. The skill levels alone defy this globalist mindset of exploiting cheap labor markets.

I got very agitated one day at the arrogance of a US bureaucrat and told them "Your policies must have been developed by complete morons and here is why I say that. The US does not hold the patents on brains, determination, nor does the US hold the patents on mathematics, physics, quantum mechanics, chemistry, medicine, nor does the US own all of the natural resources that will power the nanotechnology growth. If you think you can wave your patents in the air while producing nothing, you people are even dumber than I thought you were. Talk about intellectual arrogance of yet another failed US policy."

To this day, the US has not implemented any coherent plan to develop nanotechnology like has happened in China (2000), Russia (2007) and most of the EU nations.

S.K. That is a good analogy on what the US does not hold title to. Do you have any expansion plans that include Russia or other nations other than Austria and Slovakia?

K.S. Yes we do. In addition to our first main production plant, we also control 55 technology applications that are spin off technologies, new plants that are captive customers. They cannot make the finished product without what we make at the main plant. Somewhat in western terms, we are both vertically and horizontally integrated, and that is giving our US based competition fits. They cannot figure out how to produce at the purity and volume we can and we are already moving into finished products they cannot clone or produce.

S.K. Where are these spin off technology plants to be located?

K.S. Austria is getting our headquarters, Global Business Development Center, our nanomachines division (relocated from Canada to Austria), our R&D Center, which is about 2 square kilometers in size, and 10 of the spin off plants. Slovakia is getting the main CNS plant and 7 spin offs, Armenia 3, Malaysia 6, Indonesia 3. We have yet to determine what nations we will locate more spin offs in. So we are starting this race as a multinational.

We have notified certain parties in Russia that we would like to put around 6 technology spin offs in Moscow, Saint Petersburg, Kirov and Kazan, and possibly a second major CNS production center at Novorossiysk area, at the Black Sea. We are using the Odessa Ukraine port for our delivery of ethylene for the Slovakia plant so making a second stop in the area would be easy to do.

S.K. So, in addition to your first CNS production center, there are many spin off plants creating many more high tech jobs?

K.S. Yes, 35 spin off plants in Phase I alone, and all of them producing products that are dependent on the high purity and high volume our Slovakia plant will produce. As the R&D progresses, the number of CNS production facilities and spin off plants will grow.

S.K. How many employees will it take to operate the Slovakia CNT plant and what type of skill levels?

K.S. No one has ever done a plant such as this, but nominally we will have around 4,330 employees including physicists, chemists with BS, MS and PhD degrees, many different types of engineers and technicians, and will operate on three shifts, 24 hours a day, 365 days a year.

S.K. Would a CNS production facility in Russia be comparable to the Slovakia plant?

K.S. It could be an exact twin but our plans for the CNS Production Centers 2, 3, and 4 are twice as large in output capacity and would require proportionately more employees. We already have major corporate customers wanting to buy from us due to our purity and morphology domination, but the Slovakia plant capacity is allocated solely to our own spin off technology plants. We have no surplus to sell to firms like Lockheed, Akzo Nobel, Airbus, etc who have contacted us about supplying what they need.

S.K. We understand that China tried to recruit your company to build in China rather than the EU, is that accurate.

K.S. Yes, they wanted us to abandon the EU plant and build a much larger facility near Tianjin China to support the new Airbus A320 facility being built there now. They also wanted a shift of the spin offs to China and we declined to put ourselves into a situation of being so dependent on China for capacity to do the spin off plants. In the end they offered to buy our technology outright and we declined that offer as well.

S.K. What type of spin off plants do you envision for Russia?

K.S. If we could get certain parties to respond in Russia, the Moscow plant would be aerospace related, both commercial and a new commercial satellite technology we control, Saint Peterburg would be automotive related, and Kirov would be making several versions of our nanofilters for residential, commercial and industrial applications. Our satellite system, due to what it will do, might be a platform that makes us a true private space program that would expand on the purpose of the technology to better manage Earth resources.

S.K. Who has your company contacted in Russia regarding this project and the spin off plants, possibly a second major CNS production center?

K.S. It is a long list running from President Putin's office to Rosnanotech, many of the Rosnanotech board members, every major university in Russia engaged in nanotechnology R&D, several development banks and nanotechnology companies and several of the key research groups at Novosibirsk.

S.K. Have any of them responded to this opportunity?

K.S. To date only Novosibirsk. We provided them the parameters of our process and they were interested. I have been invited to visit as soon as I can travel there, and the other parties we are still waiting to see if they want to take a large step into the areas of nanotechnology that my company dominates. Even some of our competitors begrudgingly admit that we are the Gold Standard in carbon nanotechnology.

S.K. What plan of action would you implement if Russia does nothing to secure getting these facilities?

K.S. Ukraine would probably get the nod for the CNS Production Center and the spin offs would be there or possibly Malaysia. We are on a fixed timetable and cannot wait on indecisive people or failure to act.

S.K. Some of our local contacts told us, and showed us an article you wrote, about H5N1 bird flu being a US devised bioweapon to expand US exports of poultry. Is any of your R&D directed at military applications?

<http://www.rense.com/general78/gene.htm>

K.S. It is a devised bioweapon but treatable and they are trying to penetrate and expand in beef and pork exports too. We are not in the defense or weapons business in the sense of use as a weapon against any peoples or nations. Our R&D in that area is more in the nature of countermeasures to negate or neutralize such weapons. Said another way, anything devised by man can be beaten by another man with better technology. Our approach is more one of making

such weapons useless and a waste of time and money, not to mention brain power needed for far more important issues confronting this planet.

S.K. Where do you stand on this growing debate about the Einstein version of the Relativity Universe and the new Electric Universe Theory put forth by many visionary thinkers around the world?

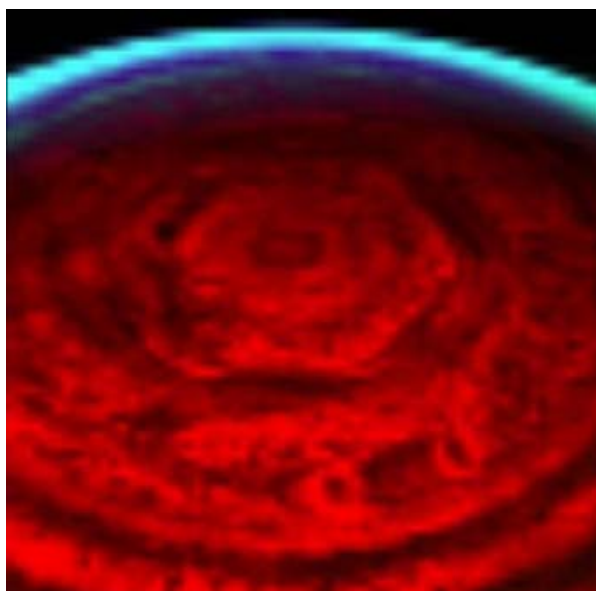
K.S. I would have to say, since our CNT process is very much a function of the Electric Universe principles, that over time I believe the Electric Universe theory will prove to be our next step up the ladder in physics I alluded to earlier. I do not think the Newton and Einstein physics will hold up once the scientists understand that the Electric Universe Theory is probably that Third Millennium Physics starting to appear on the horizon now and much earlier than most expected. In a way, it will not invalidate Newton or Einstein; it will refine them with answers and knowledge that could not be foreseen in the time of Newton or Einstein.

S.K. What do you think of Global Warming?

K.S. As presented, it is a scam that is intended to thwart the economic growth of certain nations and regions of the world such as Russia, India, Latin America, China, etc. It is a set of policies supporting an agenda to thwart growth in certain areas of the world. The temperatures on all 9 planets have increased over the past 8 to 10 years and those increases on the other 8 planets have nothing to do with carbon emissions here on Earth. It is not just Earth; the entire Solar System is under stress right now from what is apparently a variety of reasons.

S.K. What type of reasons do you and your scientists suspect?

K.S. First - the Sun. I think this Global Warming issue might well be an Electric Universe issue. It has been elevated for years in output (why is yet to be known fully) and even some strange phenomenon has been observed at the North Pole of Saturn. This photo was taken years ago by the Cassini space craft when it passed Saturn. This is part of the hyperspectral imaging that is on many satellites.



We see this type of effect in many of the nanotechnology applications we do, but that hexagon at the North Pole of Saturn is roughly the size of Planet Earth. This is a nano-scale effect but on planetary scale. That is a huge fractal and Electric Universe in principle.

I am still waiting for the Global Warming proponents, those seeking vast sums of government money for their Global Warming agenda, to explain to the world how this phenomenon has anything to do with carbon emissions on Earth. We have a pretty good idea what the combined factors are that would produce this effect and Global Warming due to burning fossil fuels has nothing to do with it. This is pure Electric Universe principle with photographic evidence. There are some strong links between Electric Universe and fractals too but that is too much into our R&D to discuss in detail.

Another factor is scientists are beginning to build up some convincing data that Earth and our Solar System are not part of the Milky Way, but are part of a smaller Sagittarius Dwarf galaxy that is now merging with the Milky Way. If that proves to be true, the sheer gravitational tidal forces could easily wreak havoc on the weather on Earth and explain elevated output from the Sun and elevated temperatures on all nine planets of this Solar System.

<http://www.viewzone.com/milkyway.html>

S.K. Is nanotechnology what could be defined as a “disruptive technology”?

K.S. Yes, it is and it will be very disruptive but in some very beneficial ways to mankind.

S.K. Can you give an example of how that might be so?

K.S. Certainly, most people know that our oil and gas resources are to some extent finite and that we cannot keep consuming like we have in the past. It is not sustainable and due to demand and other factors the price of energy is now damaging the ability of nations to expand their economies to create new jobs for their own populations. Carbon nanotechnology and other sectors will over time completely replace the need to power automobiles with petroleum. That is just the future of two major industries, energy and automotive.

S.K. I can well imagine that such a possibility would not be popular with certain governments and big energy companies that are making record profits due to what is happening in the energy sector.

K.S. I have yet to meet the energy executive who has figured out that petroleum, whether oil or natural gas, is the key feedstock to make carbon nanostructures. So, where one industry will die, the gasoline powered automobile, another will take its place with a much higher value added scenario. I want to have a long talk with the first major oil company executive who figures that out.

S.K. Have any of the Russian energy companies been contacted about that type of scenario?

K.S. Yes, we have relationships with several parties close to LUKOIL, including one of their subsidiaries, and the matter has been discussed with them. However, it seems the light bulb has not come on yet where they understand that carbon nanotechnology will over time replace the automobile powered by gasoline but carbon nanotechnology itself is based on hydrocarbons and will take the place of gasoline as an economic revenue generator. Most of the energy companies seem to be more focused on their fixed infrastructure and making money now, appeasing their shareholders, rather than thinking about what the future holds for them.

S.K. That would be interesting to watch happen. How long do you think it will take to start making such a conversion from gasoline to other ways of powering automobiles?

K.S. I cannot say what timetable our competition is on but we will be meeting very soon with one of the larger automakers about our Hydrogen Power Systems, or HPS as we call them. If we conclude those negotiations there could be automobiles within 3-4 years that have no need for petroleum except as lubricating oil and grease, and over time maybe not even that. The constant is that three of those 5 nanotechnology components necessary to make the HPS will be derived through carbon nanotechnology which is dependent on ethylene, whether derived from petroleum and steam crackers or from natural gas.

Most of the energy companies I have met with still do not get it that even their industry is going to have to evolve or die. They do not seem to be thinking much about how nanotechnology is going send shock waves through their industry. The smart ones will evolve to higher value added production; the dumb ones will be extinct.

There is a saying that fits – the only constant is change. Nanotechnology is one of the biggest changes in the history of our species. I think most energy companies will be the last to figure that out.

S.K. Is this HPS a form of hydrogen fuel cell?

K.S. No, it is an entirely different approach to hydrogen power and is completely independent of any distribution system problems which is one of the excuses Big Oil uses to not push in that direction. They have to remain loyal to their shareholder's profits, not the debits they are slamming to their customers.

S.K. Would it be accurate to say that your R&D focus goes beyond just carbon based nanotechnology?

K.S. Yes, that would be accurate. We are also involved in nanopowders, nanoparticles, monatomic state elements, nanoceramics, nanopharma, medical, energy, environmental applications, life sciences, and even toxicology. We are also the only private sector, privately held firm that we are aware of that is also pushing the mathematical research to the next level that is needed to develop the full potential of nanotechnology.

S.K. Can you divulge any details about where your R&D efforts are headed?

K.S. Not much other than to say we have in planning right now over 900 directed R&D programs that will be initiated while the Slovakia CNS plant and the Austria R&D Center are under construction. Those new directed R&D projects are a direct result of R&D we have already done and expanding that into new areas of products.

S.K. Earlier you mentioned monatomic state elements. What exactly is that?

K.S. Scientists have slowly learned over the past 5-7 years that not all is what it appears to be. For example, monatomic gold is not heavy nor is it gold in color. When reduced to its smallest possible particle size (monatomic), it is a white powder that is silica in nature and properties. We are pushing every element on the chemical chart to see what lurks just under the surface if an element such as aluminum is reduced to monatomic state. In the instance of gold, there are potentially some vast applications in medicine and energy, but for the sheer cost of gold and how we value it here on Earth.

S.K. Interesting, we also understand you are a very well known conservative Republican in America but do not support the current policies of the US government. Is that accurate?

K.S. It is quite accurate. I have not supported the policies of my nation since 1991. America has some serious internal problems that are a direct result of insider influence and policies that are not workable for a nation, just the elite few. At one point in time I was part of that policy development and now clearly see that it was not a good idea.

S.K. Is it true that you were thinking about running for President of the United States?

K.S. That is also true. Millions want me to run but I decided to decline for two reasons.

S.K. Can you elaborate on those two reasons?

K.S. Yes, I am having way too much fun doing nanotechnology and I think this science can fix more problems than I could fix as President of the United States. Secondly, I do not think America is quite ready yet to have a First Lady who is not a U.S. citizen. I made a simple decision that my personal life is more important to me than having an Oval Office or holding any political office. I would consider it a higher honor to be Nanotechnology Executive of the Year than President of any nation.

S.K. We understand you wrote a book that was very critical of the Bush Administration, titled *One-Way Ticket to Crawford Texas*. Can you elaborate on that for our readers?

K.S. The book was actually critical of both US political parties, Wall Street and the corporate and government fraud that rears its head just about every time the politicians brag about how much America stands for "the rule of law". Most Americans know otherwise and know that our government is very corrupt and so are many of the major corporations. The system is both broken and corrupt. We have a saying in America, how can you tell if a politician is lying? Their lips are moving.



I am one American that has no problems exercising my right of free speech and pointing out the problems and the solutions. Washington, DC is full of morons in my opinion that create nothing but problems, no solutions.

S.K. Is your book still available?

K.S. Barely, there is one radio station in Texas that has a few copies left. I did an updated Second Edition but it is only available in PDF format and I just give it to people that want a copy and email it to them. I did not have time to worry about publishing it and doing a book signing tour.

S.K. We also watched the video of you on the Internet regarding 9-11 event, *Confronting the Evidence*. <http://www.youtube.com/watch?v=2bTp9sSuzpl> Was that the first time you went public against the policies of your government?

K.S. Yes and no. My office was in Washington, DC for 7 years and I was a very high level policy and strategic advisor to the Republican National Committee. I have been fighting behind the scenes against government and corporate fraud since 1982 and I have spoken in public on many occasions about what is wrong and what it will take to fix the problems. Last I heard about 500 million people worldwide have seen that video of me and millions have heard me the over 200 radio shows I have appeared on as a guest. That video was the first time I was televised and saying what I have to say but my positions have been clear to many people for many years.

S.K. You mentioned earlier that highly pure carbon nanotubes have remarkable properties. Can you elaborate on that some for our readers?

K.S. Yes. CNT that are 5 to 10nm in length have electrical signatures that mimic certain parts of human cells and DNA. At that scale, certain measures can be taken to correct genetic defects, chromosomal damage, new types of ways of dealing with some very deadly or debilitating illnesses and chronic conditions, etc. We are doing some exciting research in neural prosthetics, correcting nerve damage, artificial hearing and some other areas I cannot discuss at this time. We are also doing a very large R&D project involving the entire interleukin family to find ways to shut off some of the bad things that happen in the human body when any of the 34 different known types of interleukin get out of balance. They are closely tied to regulation and stability of the human autoimmune system.

When the scale increases only slightly, CNT can be either insulative, or conductive or semi-conductive like electronics and computer components. They are also very photonic in nature and we have exploited that characteristic in several ways such as optical switches and optical nano-processors for next generation computers. Highly pure CNT can be modified, or engineered to produce many end results that lower purity CNT cannot do. In other forms, we make thermal heat sinks that cannot store or conduct electricity but do conduct thermally sort of like a nano-scale thermoelectric device. That is one example of how this science can be manipulated to defy known physics and chemistry because carbon is electrically conductive. We have developed a wide range of thermal heat sinks for new types of fabrics, computer and nano-scale electronics, geothermal, surgical and medical applications, etc.

On a larger scale, carbon nanofibers woven in certain ways are about 15 to 17 times as strong as Kevlar, the material that is used to stop bullets.

S.K. What would such a material be used for that is stronger than Kevlar?

K.S. Automobile tires that would be virtually impervious to penetration and having flat tires. Airplane, helicopter and automotive bodies stronger but lighter than the metals being used today, and of course, bullet resistant materials that are 15-17 times as strong as Kevlar. I forgot to mention earlier that CNT and CNF are also energy absorbing in some ways that almost defy the laws of physics as we know them today. The possibilities are virtually endless and limited by only two things.

S.K. What are those two things?



K.S. Either the physics and chemistry of the Universe created by God will not allow it, or secondly, we have not developed enough knowledge to understand how to do it.

S.K. How can you control the size of something so small?

K.S. It is a function of inputs, temperatures and time those temperatures are sustained. Our machines are designed to handle many variables. At the spin off plant level, we have had to and continue to create machine designs that can handle quality control of something the human eye cannot see.

S.K. And all of that has been done by your team of scientists?

K.S. Yes, and much more. Many outside scientists have already teamed up with us because we have a crucial link that is needed for them to move their patents and research into real production. We have had the advantage of over 4 years of directed research with high purity, high morphology CNT while our competition has been stuck on purity issues, scalability of their processes so they can produce at industrial levels and other issues that are holding them back. That lead time has proven to be the difference in what can be done, what we have done, with this science from the lab to industry and into the hands of consumers.

S.K. As someone who is involved in this science every day and has been since about 1999, what do you see when you consider the future of this science and its benefits for mankind?

K.S. The answer to that would have to be in several parts so it would make sense to your readers. First, almost every process we take for granted as the technology of today is very inefficient. Nanotechnology is forcing greater efficiencies just due to the nature of what it takes to excel in this science and technology sector. Literally, some industries are going to be faced with that evolve or die scenario within the next 5 to 10 years. I see that both as inevitable and a good thing if done right.

Secondly, this entire dynamic of mankind and technology truly is in its infancy. We have accomplished much but as a species I believe we have a long way to go before we can pretend to know it all. I firmly believe due to what I have seen in our labs, there is a Second Millennium physics, where we are now, and there will be a Third, Fourth and Fifth Millennium physics that will make us today look like kindergarten children as to our abilities in science and math. This is one area of progress that I believe will benefit everyone on this planet.

Lastly, this science is much like the issue of nuclear energy in that it can generate electricity to power economies or be used to destroy most if not all of human life on this planet. When Russia detonated what was called “the Father of all Bombs” in 2007 that was merely ethylene oxide and probably something in nanopowder form like aluminum nanopowder, but close to nuclear weapon in energy release. Several US labs and defense contractors are working on very powerful bombs made of aluminum nanopowder.

This science has the potential to make this planet work for all, improve quality of life and standard of living, or destroy us all. That is a matter of scientific ethics and in whose hands this science is controlled.

This is a major step forward for mankind and a major opportunity. It is the future of many things.

S.K. You mentioned earlier the issue of toxicology. Is there anything about this science that worries you in the area of toxicology?

K.S. Yes, several things and we are committing effort and capital into something that apparently has no economic return. In the wrong hands, and no ethics, there are things about this science that do bother me. Too many are engaging in this to make money, without regard for the negative effects it might have. To my knowledge, we are the only private sector company that is doing toxicology research parallel to the R&D that is geared toward commercialization.

I see articles about companies developing nano-additives for food and see little benefit in that other than making money. The human body reduces food to nanoparticle size anyway, so unless they are improving what food already does for the body as an energy source and balance of health, I do not want it in my food chain and what I eat. Those companies have a long way to go to convince me of the benefits of what they want to dump into the food chain is safe for human consumption.

It is already known that particle size does matter and can be toxic and deadly. A small enough particle of cotton has been proven to be able to cause a malignant tumor, so do we ban cotton or do we finish the research on how to cure human ailments? CNTs have been around probably since Creation and nanoparticles are part of the fabric of the Universe, always have been. Heat and carbon under the right conditions makes low purity carbon nanotubes, including diesel engines, forest fires, making charcoal, etc. Other types of nanotechnology can be toxic if precautions are not taken.

The R&D is accelerating and commercialization will accelerate but there are some unanswered questions about benefits, about toxicology, about risks versus rewards.

I personally think the private sector needs to address the toxicology issue before the governments and bureaucrats do and totally screw up this opportunity for mankind. I am not an advocate of government control of much because governments do not excel at doing things right. They tend to screw up more than they fix, regardless of what nation. I call it the Tyranny of Bureaucracy.

On the other side of this issue, nanotechnology can do things to address toxicity, environmental pollution that no other science can. There are many good things, some bad things so each step of it has to be balanced and not ignored like industry has done in the past.

S.K. What do you think about the reports that have come out warning everyone about the dangers of nanotechnology?

K.S. Two sides to that. There are dangers but not in the hands of scientists and companies that have a high level of scientific ethics, sort of a “do no harm” approach to this new opportunity and will balance benefits as a justification for profits. Secondly, I am aware of who funded many of those reports behind the scenes and many of them are financed by the same US conglomerates that are trying to get into position to dominate nanotechnology globally.

We jokingly call such reports Nano-Boo Reports and they are intended to create a stall in venture capital and private investor money and financing so that there will not be a myriad of competitors to those companies that do not want competition, they want absolute domination. Some of those same companies could not care less about toxicology or harmful effects; they are focused only on domination and profits.

S.K. Our local source told us that you are very interested in Russia and its many scientists and mathematicians. Is that accurate?

K.S. Yes, very accurate but not to brain drain Russia of its talent. Our scientists recognized about 4 years ago due to some things we have discovered that the mathematical skills of most scientists are not up to par with what is needed in some levels of nanotechnology. There are several 2006 Fields Medal winners from Russia, Dr. Grigory Perelman of Sankt Peterburg who declined the award, and Dr. Andrei Okounkov of Moscow, and both excel in fractal and differential geometry. We have found that much of nanotechnology is fractal in nature and such minds are going to be needed to develop this science to its full potential.

As for scientific skills, most Russian scientists I have met have not had the resources that say US scientists have had but they still accomplish much through brains and determination. I think if it is done right, Russia can have a bright future in nanotechnology just with the skills I know are in your homeland and the vast natural resources that will be needed. If our scientists are right, there are some stunning possibilities in the near future that would be like science fiction to speak of them today.

S.K. What types of things would seem like science fiction?

K.S. Engineering projects of colossal scale that would be powered in ways that today are not even discussed. New ways of making say automobiles and airplanes and the machines are more driven by algorithms and force fields than by say the electrical grid and natural gas consumption. Processes that are fractal rather than synthetic chemistry, driven by mathematics more than what we have used for about the past 100 years. Many processes are going to change in ways over the next 10 to 20 years that are not even thinkable today except in the ranks of some brilliant people who clearly see what is coming.

S.K. What types of things have your scientists found that created the need for such higher level mathematics?

K.S. What technology people call convergences of different technologies in ways that are quite unexpected. For example, some of the R&D we have done and are doing is seeing clear evidence that there might be a Unification Theory at the nanotechnology level that has escaped mankind since Newtonian gravitational physics and Einstein's Theory of Relativity took over the stage in theoretical physics. We repeatedly find convergences in such different fields such as A.I., or artificial intelligence, physics, biophysics and chemistry suddenly opening doors in biology, environmental and biotech. The correlations and interconnections are definitely there but fully understanding them takes much higher levels of mathematics than most scientists were trained to do, unless they themselves are like a Dr. Perelman or Dr. Okounkov.

I guess the best way to describe it, we have learned that we have to think quite differently to excel in nanotechnology. Much of the older classical teachings in physics, chemistry, and mathematics do not apply the same way in this new field.

S.K. With multiple CNS plants and an array of spin off technology plants, what level of CapEx or Capital Expansion program will your company be involved in over the next 10 years?

K.S. Without adding in three other key things we will be doing, just the CNS production centers and spin off technology plants are projected at slightly more than €48.5 billion. A very high percentage of that are the nanomachines necessary to take this science from the lab to the industrial floor to make the products. That CapEx projection does not involve the HPS at all. There are still many factors and variables being weighed in what those plants might look like and cost to build.

I can tell you that Austria is elated that we decided to move our nanomachines group from Canada to Austria and give them such a boost to their high tech exports.

S.K. Can you elaborate on the "three other things" you alluded to in the last answer?

K.S. Our R&D budget is €3.5 billion over the next 10 years but that is just for budgeting and forecasting purposes. We could triple or quadruple that number if the opportunities are there to do so. We are also targeting the acquisition of certain patents to expand our presence in certain key sectors of nanotechnology and we are making preparations to take over certain companies either through friendly or hostile takeovers. The existing companies are going to be faced with that evolve or die scenario and we believe that their current management will fail to make the decisions needed to evolve.

Many of the products you now see every day will become dinosaurs and facing extinction much sooner than many companies know. I am aware of some very large companies that should be heavily into nanotechnology R&D and have not started yet. They will soon find out that they cannot catch up.

S.K. Could such machines be produced in Russia as well as the research?

K.S. I certainly think the skills and design know-how is in Russia or could be developed very easily.

S.K. It seems that under the right circumstances you see a very bright future for mankind and what this science will do to address the many problems we face on this planet. Is that accurate?

K.S. Yes, if those right circumstances are put into place. The least qualified to manage or regulate this science are governments that will direct the resources into making war machines or directing benefits towards their political insiders. I consider that a complete waste of time, talent, resources and money, sort of like squandering an opportunity due to mismanagement.

There are also some serious issues now and on the horizon about scientific ethics regarding nanotechnology. Just because someone can make something, the question remains is it beneficial other than to line the pockets of those that created it and promote it to make money?

I evaluate many nanotechnology programs and I see a lot of good science and a lot of junk science. It is the latter that needs some very serious scrutiny as to benefits versus risks.

There are also the issues that we address every day regarding input versus output and how this science will over time improve the environment, change the way we generate energy, and in many instances people will be paying less to sustain a decent living and quality of life.

S.K. I hope that your plans to include Russia into the growth of your company materialize.

K.S. We do too. It would be a good thing for the Russia nanotechnology efforts and growing high tech jobs in your nation. We are already engaged in discussions with Austria, Slovakia, Armenia, Ukraine, Indonesia and Malaysia about spin offs and CNS production centers. We have made it clear to many in Russia that we would like to see a very broad range of R&D collaboration both within Russia and at our Austria R&D Center. This science is going to take the very best minds to get it done and get it done right. I believe Russia has human resources in that area that have barely begun to be put to good use.

S.K. Best wishes for your efforts, and thank you for taking the time to discuss this with our magazine.

K.S. You are welcome and thank you for the opportunity to let your readers know what the future has in store for mankind in nanotechnology. This is part of mankind's future and it can radically change and improve what that future would look like.

I am convinced that this niche of science and technology is the best chance mankind has ever had to make this a workable planet. Some of my advisors and friends believe we are right now a failed species and in many ways we are. That can be remedied and the future quite different if this science is done right and implemented in the right ways.

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