

Philip Clayton, Serguei Grib

Interview with Serguei Grib By Philip Clayton for The Center for Theology and the Natural Sciences

Zagadnienia Filozoficzne w Nauce nr 54, 261-285

2014

Artykuł został opracowany do udostępnienia w internecie przez Muzeum Historii Polski w ramach prac podejmowanych na rzecz zapewnienia otwartego, powszechnego i trwałego dostępu do polskiego dorobku naukowego i kulturalnego. Artykuł jest umieszczony w kolekcji cyfrowej bazhum.muzhp.pl, gromadzącej zawartość polskich czasopism humanistycznych i społecznych.

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**Interview with
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for The Center for Theology
and the Natural Sciences
edited version for spring workshops¹**

PC: Serguei, I'd like to start with a background question about your early religious upbringing and your own identity as a religious person.

SG: Okay. This first question is connected with my way if I understand correctly. I have met God in my life, personally, when I was just close to the age of fourteen or fifteen. You see, I did not live in a family where my parents might give me a good education in religion, because it was dangerous at that time.

PC: Your parents were not very religious?

SG: My father was religious, but secretly. He was a professor of mathematics, and at that time it was very dangerous to speak freely about religion. I felt that he was religious. But even with me, he was afraid to speak freely. You may compare it with Nazi Germany – it's like the same, you see? But I found the way to God with the help of God, certainly. There was a special experience, I'll never forget it, when I felt that God was and is, more real than anything in the world.

¹ CTNS Program on Science and Spiritual Quest, Spring 1997, Workshop Physics Interviews.

PC: And that had a very strong influence on you.

SG: Yes. I felt that he gives basis to everything. To flowers, to the sky, to stars, and to us. That was first. Next, I felt that God is inside everybody, also. I remember I was going in a tram, and I looked to everybody, and I felt as if they were like angels. It was very nice. That was the second experience. And then third, I felt that God is real, inside the Church. So first in the universe and in the world. Second inside people, and inside myself. And third inside the church.

PC: Now were you involved in the church during the Soviet era or only afterwards?

SG: Yes, at that time I felt a great impulse toward the church, and it was good chance that during the summer holidays, my parents usually rented a cottage in the country. And that cottage was not far from the convent, from the monastery. And because of that, I met priests, monks, I was began to speak with them and they became my friends. And this was not near our home city of Leningrad, so my father was not afraid. So being in the country, I had a chance to go to the church to be active. And it was not dangerous, you see, because nobody there knew that I was son of a professor of mathematics, even though my father was connected to very interesting themes, and he was doing some very interesting work at the time.

PC: So in your religious development you had the chance to become associated with priests and nuns earlier than many Russians did, and you were able to grow through your association with other orthodox believers.

SG: Yes. At first, when I had that experience I told you about, and when I felt that the church might be connected with the real God, I wanted to understand in “religion” better. And I was asking everybody where to find any thinker who might explain to me the way to God. And at first I found Tolstoy, the Russian writer. I found his book, and I liked to read him very much. But when I was speaking to one priest who was a former professor of mathematics, he told me, “Why are you reading the writings of that crazy thinker. He was a good writer, but was a bad thinker.” I remember his words. And then he said “I advise you to find a good philosopher. Please look for the books of Vladimir Soloviev, who is the founder of Russian religious philosophy.” Nobody around me at that time knew that name. Now I am the president of the society in honor of Soloviev. But at that time, nobody knew of him, not even my father, who was a very well educated person. But I remember well that once I was at a bookshop and I found there a book of verses of Soloviev, and I bought it with money I had been given for breakfast during classes. And so I used this money and bought the first book of Soloviev. Then afterwards, I also found his philosophical writings.

PC: As you look back now as a religious believer, and as a scientist, how would you see science and the religious traditions as relevant or related to each other?

SG: Okay, yes, this is a good question. In religion and in theology, which is connected to religion, we are speaking about Truth as Person and personal. So for me – Truth, with a capital letter,

is God. It is not the idea of God, it's more than absolute, it's real Person, real God, Trinity. Then if I look to science, I am also searching certainly for truth, but it is truth not with a capital letter. It is with a small letter. So that's the difference. I mean that this second truth is local. It is connected with correspondence. I am a specialist in solar physics. For me the truth about the sun can't be true about a person. It's correspondence between my model or the model of any other scientist and real sun correspondence between the results of our theory, of our experimental data, and of those phenomena we observe over many years. So that's the difference. Truth in religion can't be correspondence. We can't have a model of Truth with a capital letter. But we must have model of truth with a small letter. That's the difference.

PC: So religious truth involves a relationship between persons – a human person and a divine person, but scientific truth involves a relationship of statements to observations and that's why you speak of correspondence.

SG: That's right. Also, I'd like to say that we can't have any contradiction between science and religion. It's impossible. I think it was a great mistake of history when some quarrel among Catholics inside the Catholic church between scientists and theologians. It was a great mistake because these spheres, the regions over science and religion, are different. Religion in some way is more profound and transcendental to everything. I compare it to science which studies the surface. Religion has vertical lines, and so we can't have any competition or contradiction between vertical lines and the surface plane. It is impossible. I have to

point out that inside the Orthodox Christianity there was no such strong pressure or contradiction.

PC: Would science and religion conflict if religion makes a statement about the universe that is false or something? Or is it that science and religion might be saying the same thing in different ways?

SG: For us Orthodox Christians, the main thing in the Bible is not the story about the universe. It's not a story about how the universe was created. We see that it is said that the universe was created by God, but not how. We believe that it was created *ex nihilo*. But in what way, we can't understand from the Bible. Maybe billions of years, maybe in another way, maybe there was life on other planets, maybe only on the Earth. It is not written. So in this way I think we may just distinguish between two understandings. One level is connected with the revelation. It is theology. On another level it is connected with natural revelation, or with nature, it is connected with our reason or our mind. But it is another level. So there isn't any contradiction.

PC: How do you as a believer respond to what appear to be scientific statements in the Bible?

SG: I understand this question well, because sometimes I meet ones like it when I am speaking to children in the school. First I would like to answer in this way: we know that the word "day" in Russian, English, French, etc., it is not equivalent to the Hebrew word. In Hebrew it means period. It's not this "day", as we know now in our ordinary life. So it might be period, period of millions of years. It is not written. So I think that this mistake is

because of our poor knowledge of language. We think as if the Bible was written in originally English or in Russian, but it is not a reality. Maybe it's a pity, but that's a fact.

PC: So if we read the Bible correctly, there never could be a conflict with scientific teaching. Is this right?

SG: Yes, I think so. There might be conflict over some unimportant things, which might be connected with the history of writing this or other extracts. I think there are many levels in the Bible, not one.

PC: Do you think that there are any similarities in the attitudes of the scientist who studies the world and the religious believer who believes something about God? For instance, could the scientist have an attitude of awe or wonder or something? Could the religious believer use his rationality and critical thinking? Do you see any parallels or major differences in the attitude or the approach?

SG: Yes, I. I have spoken about difference. Now I will speak about the similarities. First, I'd like to mention that many, many discoveries were done in a strange way. For instance, if I remember well – the French scientist Poincaré when one day he got some coach, immediately at that time he understood how to formulate his capital idea. Just at that moment, It was inspiration. It was illumination. And when we read many biographies, we find similar things. From my own, personal experience, I have something like 50 papers connected with only one moment in my life. When I was terrified that I would finish my fourth post-graduate year without any significant result in phys-

ics and after I was told by my professor that I was stupid and lazy, I've decided to do something. And that I wrote at that night was the main idea of many my papers, you imagine? So I know personally, and I know many scientists who work in the same way. I am a theoretician. So, for experimentalists, there is some difference. They must work and work to gather data. For me it's easier to have a brilliant idea and then to write something. But I know that there is inspiration, so in some way, I compare it to a prophet who had a revelation.

PC: Is it also appropriate for the religious believer to be critical or to evaluate beliefs, or to think about the beliefs that he holds?

SG: Certainly, yes. For us Orthodox Christians, we believe in the revelation that Christ is, was, and will be the Son of God and that He is God, and it is the main point of the Revelation, and the Bible and the Gospel are related with it. But we also believe in Tradition, with a capital letter. This Tradition helps us to answer questions. If we understand the Bible in a good way, if we have real inspiration, or maybe even a false one, it is connected with the time. Church helps to distinguish. It is the same in science. I may have a good idea, but it may be that after 10 years we see it was a stupid idea.

PC: So, tell me about the process of interpretations in religion. Would it ever have an empirical moment or empirical basis? Would it use reason? Could I doubt an interpretation of the Bible?

SG: Yes, you see, sometimes for Westerners, they have a problem understanding Orthodoxy, because Orthodoxy is not in the

middle between Protestantism and Catholicism. Russian theologian and philosopher Khomiakov, wrote to his English friend in Britain that even questions from Orthodox Christians were different, not only answers, but also questions. So that's the main point. For instance, usually answers are proved by the tradition, by the church, but even this church on the earth might make mistakes. You see, we believe in an invisible church which is active here on the earth in this visible church. But the understanding of this process is very peculiar. There is no problem, because for us, the patriarchal Moscow is not the Pope. So we have some special sense, special feeling of Christianity. It is not easy to explain, but in some way I might compare it with the feeling of good music.

PC: So there is a sense or an intuition or an immediate awareness of what is most true in Christianity, and then there is reasoning which is always fallible and may make mistakes. Every interpretation is less than the ultimate truth.

SG: Yes, so criticism is certainly appreciated.

PC: Christianity believes that there is a purpose and a destiny to the created universe, not just the arrow of time of physics, but also a *telos* and a design in the universe. In your view, how does this Christian notion of purpose fit with perspectives in physics and astrophysics?

SG: I mentioned Soloviev before. He first started in mathematics and biology at the university. Then he became a theologian and philosopher. And his main idea is Godmanhood. This word refers to holy fathers of Byzantine. He meant that the whole

universe is going to Christ, all plants, animals, and especially human beings. We have *telos* or the purpose in Christ for everything; and not only for life, but also for minerals and atoms and protons and electrons and quarks, for everything. This same idea is also in the writings of the Catholic theologian Teilhard de Chardin. I like these ideas, but I do feel that they are in some way approximate. So, I feel that there is a trend, but at the same time, we know a lot about Gulag, about Auschwitz about Nazism, about Communism, about many bad things in history. We can't say that they were related with good *telos* or with anything good in the world. They were terrible. They were against everything that had developed. And so I think that there are again many levels in the world and in the universe. So on one level we see design, we see *telos*. On the other level we see terrible things. We see horrors, we see death, just as the result of the prime sin. We see all bad things. And they are real. And you see, for me, the main theme for reconciliation between science and religion inside me or outside me is to use antinomy. You see, I think that reality for our reason is antinomy. For instance, light is at the same time a photon and a wave, and we can't say it is only a wave, because that is wrong. I can't say it's only a particle. That is also wrong. But now we know that every particle is at the same time a wave; so even people may be imagined to be like waves; then even the chair, the telephone and even myself; thus everything has different sides in science. It means that reality is very profound. It is transcendental. So I think that the *telos* also, real *telos* of the universe, is transcendental. I think that if

we speak about the end of everything, about the *telos*, we must certainly understand that it has to be in time and beyond time. At the same point, meaning that it is transcendental.

PC: How much of this ultimate *telos* do you think the physical sciences could ever know? Are there signs or hints or evidence of the direction of the universe in the physical sciences? Is there anything we can know of the *telos* through our scientific work?

SG: Yes, certainly. Christ can't be understood by physics or by biology with the help of genes or something like that, or with the help of chemistry. So I don't believe for instance in the Turin Shroud. I'm interested with this problem, but I don't think it's so important from a religious point of view. Christ is beyond our experiments with radioactivity or things like that. But you see, at the same moment we have hints. We have some hints that may help us to feel that God is active; active in galaxies, active in solar activity, active in the magnetosphere of the earth – everywhere, in protons, in electrons, in everything. For instance, the so called anthropic principal is very popular now. The anthropic principal is speaking that everything in the universe is tuned in such way that looking to the beginning of the universe, just at that moment we may see some kind of a design: if only one thing is changed, we wouldn't exist. It's very interesting. And I remember that in one book of Dostoevsky, there was one hero who looked through the Bible and said "I looked through the Bible and it is written that at first there was light, and then next the sun was created, so it's nonsense." And he closed the Bible. But now we know that at first it was light, not sun. We

know that at the Big Bang, there was the creation of photons, so it was light. And even now, we have such background all over the universe called reluctant radiation. You see, it is connected with that moment. Now, certainly, real scientists can't be severe naturalists. It's impossible. I was speaking some years ago with the one very prominent physicist of the Soviet Union. He was an atheist. But you see, being an atheist, he taught that certainly the Universe had a first point and a first moment. There was a moment when the whole universe appeared. So it coincides, certainly, with the Bible.

PC: How do you respond to a scientist who says "I acknowledge that what came before $T=0$ might have been anything, that it wasn't natural, but once the moment of the big bang occurred, all the remaining processes are fundamentally natural processes, therefore I am a naturalist". Is he making a mistake?

SG: Ah, it's like the deists of the 19th century. They taught that God created the universe, and then he forgot about it, and that the universe continued on by itself without his help. But I have my own real experience, which speaks in a different way. I know, really, that God is close to me – closer than myself, and therefore I certainly don't agree with their point of view.

PC: When you talk with a scientist who is a naturalist and who has no religious experience, would you say he's making a scientific mistake, or that he lacks an experience which you have had.

SG: I may give him an example from my field. For instance, I study Sun, Earth and Solar-Terrestrial relationship. If I change

the corpuscular intensity of the solar wind just a little, or the intensity of the magnetic field of the Earth, everything would change immediately. And it's very easy to show that we have some kind of protection for life, our life. For instance, the solar wind, it is the solar plasma which goes from the Sun to the Earth. And it is dangerous. But it can't reach the biosphere, it can't reach the ground, because of the magnetic field of the Earth. The magnetic field of the Earth protects all of the Earth and us from that solar wind. But you may ask, what does the solar wind exist for? I would answer that with no solar wind, cosmic rays, which are going from different points of the universe and which are very, very, energetic, would become stronger. With no the solar wind, they would reach the Earth's atmosphere and the ground. From one side solar wind is not good, but from the other side, solar wind is very good, because indirectly it protects us from cosmic rays. Solar wind has the magnetic field frozen within it. And this magnetic field in some way protects all the planets from the cosmic rays. There is a special balance or equilibrium.

PC: So the more we study physics, the more examples we find of phenomena which seem perfectly suited to allow life on Earth to develop. And if we look at that, the scientists should say that the best explanation is that God has arranged it in this manner.

SG: Yes, but usually I like to also add one small point. I feel God in the universe, not only from my personal experience, but also from looking at the pictures of the Sun, and at the data of the space crafts, etc. I feel the presence of God there. The point is that it might help a natural scientist to find the trace of God. But

then he also has to have a personal meeting with God, you see? So there are two levels. The present situation in science helps us not to be strict naturalists. But it can't force everybody to become religious.

PC: Yes, first we find God most clearly in personal experience. Second, we find God in the sense of wonder and beauty when we look at pictures of the sun and galaxies. And would you say thirdly that we find God also in the mathematics themselves?

SG: Yes. You see, when I was speaking at first about Truth with a capital T which is God, which is personal, I would like also to stress that this Truth has projections. One projection is beauty. Another is goodness. Another is happiness. So if we find Beauty with a capital letter, it also is a projection of Truth with a capital letter, of God. Surely I find beauty in mathematics and sometimes we are looking to some theorems as if they are poems because they are brilliantly formulated. Wonderful. And so certainly we would feel the same as if we were looking at the pictures of the solar corona.

PC: Is it the beauty in the equations, or is it the order and simplicity of the mathematics?

SG: All together. And you see, the main point from mathematics is that it is very strange why the mathematics work. It is very strange. I remember before Hegel, many philosophers were speaking that the laws of our mind are the same as the laws of the universe. And it is a miracle. If we think for a long time about it, we will understand that it is a miracle. And we can't be strict naturalists after such thinking.

PC: That's beautifully put.

SG: I'd like to add something to the points I was thinking about earlier. I need to clarify something. The first idea is from my work in the field of space physics. It is that we can't be naturalists as we could in the past, say the 19th century, because we see a lot of traces of the so called ultimate reality, and because of that we may feel the presence of God in the universe.

But at the same time we are free to meet God, as Christ, as Person. So, we may feel the Absolute presence but it depends on our free will if we understand that God is Christ. It depends on our freedom. I do think also that the dialogue between theologians and scientists, is very important. It is very useful, especially for Russia and also for the whole world.

PC: Can you say a word about why especially for Russia?

SG: Yes, because in the past in Russia it was claimed that science proved that there was no God in the universe. This argument was connected not with real science, but with the ideology, because we had no real philosophy in the period of totalitarian system. We had only ideological philosophy and we were not free to speculate and to speak philosophically. I do think also that it's important for the church and for theologians because you see, now we have a very bad trend in our church. I may compare it with the trend of fundamentalism, conservatism. And in reality it is connected with communism, because many communists now say they have become Christians. But in reality it is not so. And they decided to use Christianity like ideology? And because of that they are not real Christians.

PC: So it's not a spiritual regeneration, it's a political move on their part.

SG: Yes. And they have power. There are many of them. I do think that real Christianity is not left, is not right, because orthodoxy usually is in the middle. It's not political. And I'm not for liberalism and not for conservatism, because spirituality is transcendental. It is a vertical line. And from that point of view, I do think that the dialogue between scientists and theologians may help to clarify many points in both science and theology.

PC: So it's more than just an interest. It's something that will actually help progress both in science and theology.

SG: Yes. And also, I might add that real saints, real heroes of faith were never against science. The main saints in our church, for instance, they are called holy fathers. They were real philosophers and great scientists. But now those persons who proclaim they are Christians, they forget about this fact, you see? But this dialogue may help. And also I also think it's very important to recognize that in Christian teaching on the salvation or soteriology we have many so called antinomies, and now in science we also have antinomies. So it's very interesting to compare.

Now, if we are to address the next point of Mark's letter, I might say that a human being is like singularity. We know this notion of singularity in modern physics. For instance, in singularity we can't use mathematics. It is a strange point. And one may compare a person with the singularity of quantum subject. Quantum subject, as I call it, is the subject which is connected with the reduction of the wave pattern. And now, in modern physics, this

notion of reduction is very important. Nobody in the 19th century understood that the whole universe – on the microlevel and on the megalevel and on the macrolevel depends on the subject. It's very important. And so the first point is that we know now that the interaction between the person and the particle is very important. The next point is that Heisenberg's principal of uncertainty also helps us to understand the limits of science. We understand now that science is limited. It has its good value, but it is limited. And so we can't have God as an object in science. And so we may have humility. And, going further, we know about Bohr's principle of the complementarity and how it is connected with Heisenberg's principle. So if we know some aspect of the particle behavior in a very strict way from one side, we may lose the same portion of knowledge from other side. So it's very important for understanding our human limits.

Then, if we are looking to the big bang theory, to black hole theory, to the theory of strings, etc., etc., we feel here that we are speaking not about something which we can observe, but about something which is very, very much ultimate. It is also very important. So, we may feel that the whole universe is connected with something very much profound. In this way, I understand that a person now is very much important in science. And we are going to deepen the understanding of the role of the person in science. I do think so; in every field. For instance, I'm not a biologist. But I know one biologist and he is a mathematician in Moscow who is speaking about continuity and discreteness. He says that, there are two ways of comprehending reality. Contin-

uous, which is connected with intuition, and discrete, which is the way of reasoning. It's also like that in physics. We see here two sides, and if we look to the past science, we don't see the traces of continuity. We see it in a scientists' personal life, but in their theories, there is no trace. But now we find it. It is very interesting. I think it's real progress. It's real progress of our understanding of reality, you see?

The next point is that I do think that science became closer to the Orthodox Eastern theology than to Western, because Western was very strict, connected with scholastics, with logic. But Eastern was not so. Unfortunately, in our country, we had no real religious education in the past, so only a few people in Russia now understand real orthodox theology. But if we look to books, we find treasures. It is interesting that we may compare the ideas of orthodox theology with modern physics ideas. For instance, for our orthodox view of the universe, the person is very important. If I am bad, I do bad things to the whole universe. If I am good, I'm helping everybody and every particle. You see? We are interconnected. And it is very important for the orthodoxy, because orthodoxy is speaking about deification. It means that the purpose of Christian life is to become united with God, with Christ, to become one. For instance, somebody says that saint is thinking only about himself because he wants to pray and to live alone and to do nothing for the society, etc., etc. But they are wrong, because if he becomes a real saint, he helps everybody – the society as well as protons and electrons. He helps everything. That's an idea

of Orthodoxy. And I think it is actual for modern physics. So this is for the third point.

PC: The only question I would have is that some people feel that progress in evolutionary biology has made it more difficult to see the human person as different from other life forms. If we share 95% of our genetic material with the other higher primates, how can we then assert that human beings have spiritual properties such as freedom or moral responsibility, or the possibility for relationship with God?

SG: I think that biology and the theory of evolution also, is younger than physics. And because of that, biology is in some ways closer to the science of the 19th century than modern physics. That's a difference. And because of that, in that way, biology is more naturalistic. It depends on time, I think. I am not against evolution. I think we have much data connected with evolution, but I insist at the same time that we can't understand the moment when spirit appears, because there is a moment of miracle. And in science we have no miracles, and because of that, we can't understand it. And so, if we compare human beings with other primates, with animals, certainly we find a lot of things in common; but also with the universe. We have the same protons and electrons. But we understand well that we are different from stars, so in the same way, we may understand that we are different from dogs and cats.

PC: So this is the sort of insight that biology simply does not have access to. The coming of spirit into humanity. But despite that, there really is a qualitative difference between the other

higher primates and humans who have a soul or freedom or responsibility before God. Is that the position?

SG: It's a gift. We have a gift from God – freedom. And we have a gift from God, the soul; soul and freedom. And they are interconnected. And I think biology will never understand the mechanism of these gifts. But some traces, maybe, the biologists may find. In our city, I know one biologist who is a very significant professor of biology and is a member of our society, and he speaking about the memory on the level of cells, cell's memory. It is very interesting. And in his studies, he finds something like the traces of sin on the cell's level. His name is professor Soidle and he gave a report in our society one year ago. He is even saying that we may understand by the analysis of genes if the body of any dead person was connected with a bad person or a good person.

PC: Traditionally Christianity talks about God being present and active in the universe. God accomplished miracles. God made changes in the physical world that wouldn't have occurred otherwise. He overruled the laws of nature. Many people today find that a more difficult doctrine to maintain. Do you think that the belief in God is active in the universe? Has it continued the same or has it been strengthened, or has it been put under pressure by the developments in the physical sciences?

SG: Certainly I feel that the deity is present and active in the universe. We know now that there is such a theory connected with deity and experience, which is telling us that every second in the world matter appears from the vacuum. Matter appears

from nothing. So in this way we may say that the creation of the world is going on. And it's a sign. Certainly I can't say that with the help of that theory I may understand how God created the world. It is impossible.

But, I may feel, with the help of that theory, that God is still active, and not only in myself, not only in connection with myself, but also in connection with the universe. And I think that our understanding of divinity has grown, not diminished. It can't be diminished, because science is given to us also by God. It is a gift of God, and we can't use this gift against the person who gave that gift. It would be strange, isn't it? And I think that it has grown in that way, not that we have new revelations, no. But we have new understanding of the relation and new understanding of the whole problem. For instance, in my one paper, I was speaking about the creation of the world from nothing and I used two Greek words, which are different. They are "*meon*" and "*ukon*". "*Ukon*" is nothing at all, without anything potential. And "*meon*" has some potentiality in itself. So, I may suppose, that at first God created "*meon*" from "*ukon*". And then the whole universe was created from "*meon*", and "*meon*" may be compared with vacuum. Now we know that a vacuum is very active. A vacuum is not death. It has some kind of life, because at any moment we may see the appearance of new virtual particles. We could not imagine such a thing in the past, but now it is strictly proved so it's very important.

PC: So we have a creativity even in the physical universe. Even in the vacuum.

SG: Yes. So my answer is, God is certainly active and this understanding is growing. We know a lot of interesting things around us with the help of many telescopes, we now feel eternity; eternity and design. I'd like to distinguish these two ideas. We know now that time is relative. And space is also relative. And because of that, we say that we live in space time. And if it is relative, it means that we may have some dimension from which everything is given at once. For instance, all at once we have past, present and future. So it's the next step in our mind for understanding such things. And we are speaking now about many philosophical notions in physics. It's strange. For instance, in the past we couldn't speak about philosophy if we had only the law of Ohm, for instance. But now we may speak of it. So it is certainly a next step. And then also, if we are speaking about design, we return to the, idea of the anthropic principle. And I think that many scientists had to be in the camp of that principle, even though they did not want to do it. It seems to be against their own will.

PC: I wanted to ask about the manner of divine action, because you've argued that God clearly is active in the universe. That could be in a law like way, that is, in accordance with natural law, or, in traditional Christianity, it could be the breaking of laws which is what people call miracles. I'm wondering if you think that God also acts in the physical world in a way that breaks natural laws, where he intervenes from outside to make things other than they would have been.

SG: I think it depends. God is active in both ways. He may certainly violate the law, and also he helps the law to be active.

Both are valid, you see? Because I know in my life I've had miracles, real miracles. And I think everybody in this world has also had such miracles. But they were connected not only with my personal experience, but with something external. For instance, I could have fallen when I was on the top of a volcano. And I prayed and immediately I had help. And it was connected with the laws, because I might have fallen because of the gravitation. But God helped me not to fall because of the gravitation. So both sides, we see.

PC: As we make the transition to the last question, I want to ask do you ever feel that Christianity compromises too far in order to try to establish a harmony with scientific conclusions?

SG: That's a good question, because for a long time I was a member of the European Society on Science and Theology, and I feel that Western Christianity, yes, has a great compromise. It's a pity. And for me it's also a pity. But real Orthodox theology doesn't have such a compromise. But unfortunately, our theology is very much silent. Maybe only now I am speaking about this. It is very silent. In Russia you understand why, because of totalitarian system. And in Greece, in Bulgaria, in many Orthodox countries – the same thing. It's a pity, because our leaders, our holy fathers, were very much active, and they were speaking about the world, about the universe. For instance, St. Basil, he spoke about the creation of the world, as did St. Gregory, etc., etc.

PC: So one thing that helps science to stay within its realm and to recognize its limitations is a strong, outspoken theology.

SG: Yes, certainly. In science we have principle of falsification. It means that every theory is relative and we may have after some time, another theory which will be better. But in theology, it's the opposite situation. We feel that theology is connected with revelation, and revelation gives us verification. That's the difference. But from the revelation, we may make many conclusions and these conclusions might be changed. It's possible to change them, and it's possible to use different language. And it depends on the epoch and on the science in this way. So, you see, the mutual interrelation is very useful, for both theology and science.

PC: The last question is a little bit more personal. It is actually in two parts. One, it asks about the religious inspiration that might motivate your scientific work, and for the other half, it asks about inspiration you might draw from recent progress in physics. This question asks explicitly about how your religious belief might actually motivate you as a scientist – encourage or direct you.

SG: Yes. At first I might say that my belief and my religious inspiration certainly helped me to become a real scientist, because if I was not Christian, I could have become a member of the communist party, and it was possible at that time to become administrator or director, or even academician. But then I couldn't become a real scientist. At that time, it meant to be dishonest, because a real scientist, if he became communist, in some way he lost something in his inspiration, not in his religious one, but in his scientific inspiration. And so religion certainly helped me

not to do such things. It helped also my brother and father, because my father was prominent scientist. But at the same time, in some way, I changed some specialty. And at first I was a mathematician, after that I became a geophysicist. And now I am an astrophysicist. So I am going higher... And I feel better now, because the atmosphere among astronomers is better than the atmosphere among geophysicists.

PC: And when you study astrophysics, does your Christian belief direct or guide that work in any way?

SG: Sometimes, yes. Not every time, but sometimes yes. For instance, I have three papers connected on the protection of the Earth from radiation of solar plasma. And certainly it is connected with my belief, yes. So sometimes I do. But you see, my life is in some way strange, and my career also, because even in my childhood, I liked religious philosophy, but I couldn't speak loudly about the ideas of that philosophy. Now I may speak loudly, and for instance, sometimes in the morning or in the afternoon, I am an astrophysicist, and in the evening I become a theologian and religious philosopher.

PC: So for you it is a full integration of those two.

SG: Yes, and sometimes I also try to give reports both in science and theology. For instance, at first when I was abroad in the so called "Free World", I was in Austria, and I decided to make a report there in space physics. And there is only one space research center in Austria, in Graz. And the professor there told me, "Yes, I will give such and such a time for you to speak." I told him, "But I can't speak too much because I have to do

another report.” He was terribly astonished and he asked me, “Maybe there is another space center in Austria that I have never heard about?” I said “No, I have to give a report at the Catholic community.” “Oh,” he said, “you are kidding. You are a Soviet scientist. It can’t be so.” But it was. Yes, it looks like a joke, but it was a real event.

PC: Sergey, can you conclude by just saying briefly how your work in science has inspired you as a believer? What are some of the ways in which you have been inspired by the results that you’ve studied in geophysics.

SG: For instance, I may say that the knowledge of modern physics, the knowledge of modern astrophysics, helps me to be in some way more spiritual. You see, I think that now it is very important to become a real believer. Not “ideologist”, not fundamentalist, not a believer in one’s own customs, but a real believer. At first I had real experience in my life, but the second point is to have mind, which may help to speak in peculiar, authentic ways on these things. And certainly science helps me in that direction.