

ADDRESS BY THE PRESIDENT OF THE FRENCH REPUBLIC

35th International Conference on High-Energy Physics

Palais des Congrès, Paris – Monday 26 July 2010

Madame Minister,
Ladies and Gentlemen,

I welcome this opportunity to speak to you at this 35th International Conference on High-Energy Physics.

You have come together to share your work as the leading scientists in your field. And what a field it is! I will certainly not attempt to describe it - I would be far out of my depth - but I know that your work epitomises the purpose of science, its primary goal - to expand the frontiers of knowledge, to explore and map as yet uncharted areas of understanding. There is no greater human endeavour than the work you engage in day by day.

You study the mysteries of matter, the configuration of an infinity of particles that forms the universe and lends it coherence. Your field lies upstream of the other sciences, at the far reaches of two infinities, and extends from the infinitely small to the infinitely large, from the subnuclear to the cosmic.

The mind boggles at an attempt to even imagine the questions you explore. At one time these questions belonged to the realm of metaphysics. The days when Giordano Bruno was sent to the stake and Galileo (who received better treatment) to prison for their discoveries are long gone and you have the good fortune to live in our times. But science is, I am well aware, a fragile enterprise and scientists must be defended against obscurantism, fanaticism, wilful ignorance and contempt for the truth. These dangers still threaten us, as they always have.

Ultimately, your work pursues the oldest dream of humankind, the attempt to discover the origin of the universe and of matter. You address the question that human beings have asked themselves since time immemorial, which, in the end, is simply put: Why is there something rather than nothing? You formulate this existential question, scientifically, as an enquiry into the structure of the universe: What is it, how does it behave, and why is it the way it is? But in the end, it all boils down to: Why is there something rather than nothing?

Far from being cowed by the complexity of the world surrounding us, you are galvanised by the scope of the endeavour. I can identify with this slightly peculiar attitude - never giving up in the face of the unknown, overcoming difficulties that have existed for centuries, doggedly pursuing the task you have set for yourselves. Such strength of purpose distinguishes the researcher, and especially the scientist working in basic research.

To the malcontents, and there are some, who claim that your research is divorced from the life-and-death issues facing our planet – disease, poverty, lack of development – I say that the pressing issues of the moment must not and must never be allowed to compromise the future. To see the two realities – the short- and the long-term exigencies – as conflicting with each other is to miss the point. Knowledge is indivisible. The surprises that the seemingly most gratuitous basic research holds in store for us have generated some of the most beneficial innovations affecting our daily lives. Your work and the equipment it requires have spawned cutting-edge technologies - including the World Wide Web, which was invented at CERN, the European Organisation for Nuclear Research.

Basic research does not focus on concrete applications, but a country that fails to give it priority is making a historic blunder. The scientific edifice must be comprehensive: there can be no applications without basic research or breakthroughs without its results. Electricity was not discovered by attempting to improve the candle – to give an example more or less within my grasp. As Pasteur put it, “There does not exist a category of science to which one can give the name applied science. There are sciences and the applications of science, bound together as the fruit of the tree which bears it.” You enable the tree of knowledge to bear fruit in many different ways. But you nourish it with what brings you together: the love of learning.

Science is an endeavour that must be grounded in society. I don’t need to remind you that a great scientist in your field, Steven Chu, was recently appointed Secretary of Energy in the United States (no message concerning our compatriot Claude Cohen Tannoudji, who received the Nobel Prize with him, intended) – demonstrating that in addition to their pursuit of knowledge, scientists are capable of action.

The underlying unity of knowledge is clearly in evidence in the recent history of your field, physics. You have managed to decompartmentalise the field by fusing cosmology and particle physics. And how many physicists have gone from counting atoms to analysing cell function, helping to drive recent progress in biophysics?

I hope you will further decompartmentalise knowledge by making it available to ordinary people. You have nothing to fear or be embarrassed about when sharing your discoveries with the general public. Our contemporaries have an appetite for knowledge and boundless curiosity about science. It is up to you, the scientists, to share your knowledge. You do not lower yourselves when you express the infinitely complex in uncomplicated terms. In fact intelligence could be defined as the ability to explain complex phenomena in a straightforward way - not that this is easy. At a time when the number of young people choosing science as a career is declining alarmingly, it is up to you, in your various countries, to foster a love of science and general scientific culture.

Ladies and Gentlemen, in our day and age, science sometimes comes under attack. It is true that in solving problems – and this is the fate of the scientist – you create new ones. In answering questions, you raise new ones that are even more challenging. But man is fated to constantly create and to innovate in order to progress.

So we – policymakers and scientists alike – are all called upon to support scientific work to enable humankind to progress. Science and scientific research will help us to solve the problems facing humankind. Obscurantism, ignorance and conservatism can only lead to suffering, frustration and decline.

This is why Valérie Pécresse and I are proud that you chose France as the venue for your 35th Conference.

Allow me, here, to pay tribute to the French scientific community working in your field. Our country cultivates materials science; the Nobel Prize that went to Pierre Gilles De Gennes is a case in point. Our physicists build on a long tradition of research in France, extending from Pierre and Marie Curie to George Charpak, the inventor of the multiwire proportional chamber, and recent Nobel laureate Albert Fert, to mention only those working in atomic physics.

Cutting-edge research comes into its own in our major research institutions, the CNRS with its IN2P3 Institute and the CEA with its IRFU institute of research on the fundamental laws of the universe. We have developed world-class laboratories, including, to mention only a few of the leading teams, the Louis Leprince-Ringuet laboratory, the Ecole Polytechnique laboratory, the linear accelerator laboratory at Paris-Sud University in Orsay and the nuclear and high-energy physics laboratory at Pierre and Marie Curie and Denis Diderot Universities. All these teams epitomise high-quality French basic research and are emblematic of its leading role, at European level, in the work of CERN in Geneva.

This tribute to French science encourages us. France has made an unprecedented commitment to research. In the current economic downturn, many countries have chosen to curtail their research budgets. As you know, we chose not to cut ours. Instead, we increased it.

With western economies going through a difficult period - a recession unlike any the world has experienced since 1929 - governments are obviously tempted to postpone needed investments in science. If you were in our shoes, you would be tempted too.

But we in France took the opposite tack, considering that higher education and research are the solution to the recession. The economic downturn should not prompt us to postpone investment in science, but rather to bring it forward and consolidate it.

This is not digging ourselves deeper into a hole; this is common sense. We cannot afford to fall back on obsolete certainties. We must unremittingly strive to find new solutions and to steadily create the new knowledge that will be our best weapon in fighting the recession.

As far as we were concerned, the first order of business was to improve the responsiveness of our institutions of higher education and research. I don't need to tell you that additional funding would be pointless if it were invested in obsolete structures. Together with Valérie Pécresse, we gave the universities an opportunity to become autonomous, take their future into their own hands and fully involve themselves in the research effort. A few years ago, the very mention of the word autonomy in France brought people into the streets. We have enabled our research institutions to break away from a complex organisational structure that had straight-jacketed them to the point of paralysis.

In this country, we are reforming and investing as never before.

Since I was elected in 2007, we have added one billion euros a year to the university budget. Since 2007, the public research budget has increased by 800 million euros per year.

We have earmarked five billion euros in funding to renovate our university campuses. This will enable us to create some ten major campuses that meet the highest international standards. Skills, ideas, degrees and disciplines must come together in a real campus. There is no such thing as a virtual campus. And I was tired of watching France dream of having the kind of campuses that exist everywhere else in the world. We needed to stop dreaming of them and build them. Why confine ourselves to looking at what others are doing? We do better to take inspiration from them.

Finally, in the midst of the recession, we introduced a 35 billion euro Investing in the Future investment plan for the coming four years. Two-thirds of this funding will be devoted to higher education and research, with one-third specifically earmarked for applied research in such fields as aerospace, non-carbon energy and the digital economy.

The purpose of these huge amounts of investment is to nurture our best teams and best campuses, to ensure that our country plays its full role in international research. Among the excellence teams in which we place our hopes, I would single out the scientists at the Saclay Plateau. Until now, the fact that they all happened to be there was considered serendipitous and no one thought to leverage the potential advantages of having them all in one spot. For years, we had been telling ourselves, as it were: here we have high-tech companies, research centres, top engineering schools, laboratories, universities - what a coincidence! It is as if we had all the ingredients of a Silicon Valley but were waiting for a Christopher Columbus to come along and discover it. We had something and didn't know it. Now we want to make Saclay into one of the world's best research campuses by fostering synergies and coordinating the work of all – scientists, entrepreneurs and investors alike – who operate there.

I am aware of the great hopes that the French high-energy physics community places in this undertaking. You have developed a project whose quality I commend. With more than 2,000 scientists working on subatomic physics in ultramodern facilities, you can develop a “Fundamental Physics of Particles, Space, and the Universe” cluster around the CEA, CNRS, Paris-Sud University and Polytechnique laboratories. This will give you one of the world's leading research centres in your field, a centre that can support projects requiring ambitious large facilities. And naturally at the Saclay Plateau, the proximity to leading specialists in other fields – laser science comes to mind – offers promising potential.

Finally, I am mindful that knowledge revolutions often occur in unexpected places and that we must remain open to all forms of innovation. So my message to the French scientific community is this: “Be ambitious; put forward unconventional projects; submit innovative proposals; and overcome the divisions in your organisational structure. Push the envelope, and keep pushing it!” You said in your introductory remarks, Mr. Chairman, that democracy was not your focus. So let me address it. By this I mean that Valérie Pécresse and I do not want to replace a rigid system with another rigid system just for the sake of spending money. We want to revitalise the system. We want flexibility. We want pragmatism. We want you, the research scientists, to be able freely to work in your fields. Then, naturally, there will be the issue of evaluation, results, competition, in a nutshell of excellence. But that is your stock in trade and you don't need me to point that out.

For the Saclay project, we have already earmarked one billion euros for investment. I have been hearing about Saclay ever since I entered politics, and I have never yet seen a cent spent on Saclay. We have earmarked one billion euros. The money is there. Other funding will follow and I am certain that the teams working in Saclay will be submitting projects that can be included in the Investing in the Future investment plan.

But our ambitions are not limited to France's science capabilities. Excellence in research must be built within the European science space. France has taken initiatives to ensure that Europeans jointly plan research in areas such as cancer and Alzheimer's disease. We must stop doing research in isolation from each other. And I want the same approach to apply in other fields, such as supercomputing and nanotechnologies.

We want to make Europe the world's leading scientific power. Europe now trains more engineers and science PhDs than any other continent. Europe leads the world in scientific publications. In a spirit of healthy competition with the other continents, we must transform these assets into true advantages - advantages for the countries, the populations and the economies of the European countries, and advantages for universal progress.

We must not allow the economic difficulties we are currently experiencing to frighten us into cutting the funding we provide for research and higher education. The French-German tandem illustrates the European ambition and will continue to do so.

Beyond this European dimension, I call for true international cooperation. You are already applying it. As research facilities have become more advanced, more powerful, they have become more costly. Your community needs investment in large facilities and we cannot ignore this need. It is therefore in our interest to work together across all the continents.

Let me give you one example among many - the CERN Large Hadron Collider near Geneva, the world's most powerful particle accelerator, inaugurated two years ago. The first collisions have provided important results, which are to be announced - so I am told - at your conference. In addition to collecting new data, the facility is developing new technologies. The CERN accelerator has spawned a host of technological innovations in such fields as medical imaging and hadrotherapy to treat cancer. And to process the vast quantity of data collected in the large colliders, you have built computing power that opens up a broad range of promising scientific calculation applications.

This one example suffices to demonstrate the vital need to invest in large facilities. But no single country or even small group of countries can now afford the investment required - hence the need for broad cooperation among States.

I can assure you that France will be attentive to promoting such international cooperation and to contributing its proper share to it.

Ladies and Gentlemen, you will have understood that it is with great pride and enthusiasm that I speak to you here today. Working in many fields, coming from many different backgrounds, you represent the hopes of world science, the hopes of the planet. Ultimately, the future of the earth rests largely in your hands. Many people have asked me why I planned to attend your conference. This shows that I have my work cut out for me explaining what you are doing. Is it not important, as the Head of State of the world's fifth-largest power, to

address a community of scientists who, in the long line of knowledge and scientific understanding, are responsible for the future of the planet? It is extraordinary that people should be surprised at my presence here. It is extraordinary that it does not occur to people to systematically involve you in the major decisions, choices and endeavours that we statesmen are responsible for making and pursuing as part of our jobs. Your job is not an easy one; neither is mine. But I believe we need each other. You need us to give you the resources and the framework for your work and to protect your freedom of research. And we need you to ensure that your research comes up with the innovative solutions we require if we are to address the major issues facing the countries we lead.

I thank you for choosing France; I thank you for choosing Paris; and I thank the French scientists for ensuring that French science meets the highest international standards.

I wish you all the best in your work.