

## Governmental encouragement to nanosciences and nanotechnologies in Argentina

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Compared with Brazil, or with the United States, where since 2001 governments have been encouraging through public funds the development of nanosciences and nanotechnologies (N&N), the governmental encouragement in Argentina is relatively new. In 2004 a policy favoring the development of the N&N started to grow, exchanging various concerns, a policy which was set in motion not deprived of certain doubts and discussions.

On March 18, 2004 at the Secretary of Science, Technology and Productive Innovation (SeCyT) from the Ministry of Education, Science and Technology, the *First Workshop on nanosciences and nanotechnologies in Argentina* (SeCyT, 2004) was held, where the N&N status in Argentina was stated, being the technological challenges for the development of science and technology in such areas identified. The attendants agreed on the need to create a *National Network* to gather all such scientists working at the N&N areas, giving birth to working commissions in order to prepare a preliminary document containing ideas and recommendations for a future *Vacancy Area Program* (PAV) where the Argentine State should be particularly interested in its development.<sup>3</sup>

On November 9, 2004 the National Agency for Scientific and Technological Promotion (ANPCyT) gave rise to the 2004 call for projects' submission within PAV framework, for the following areas: forest and farming production; biomedical technologies; coast area and sea food resources; nanotechnologies; energy; environmental pollution; aeronautics; state and society. Such call ended on February 15, and resulted in the allocation of 3,553,982 Argentine pesos<sup>4</sup> (23 % of total funds allocated) to grant the four N&N projects submitted, all of them at the type II vacancy area<sup>5</sup> (ANPCyT, 2004).

Financed projects were as follows: "Network laboratory for designing, simulating and manufacturing nano and micro appliances, prototypes and samples", with \$898,769 (UN Entre Ríos, CNEA-CAC, CONICET and UNL, CNEA-CAB, UN del Nordeste);<sup>6</sup>

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<sup>3</sup> This first workshop was attended by: the President of the ANPCyT, Dr. Lino Barañao and representatives from various research centers: INQUIMAE-FCEYN-UBA, Dr. Sara Bilmes and Dr. Ernesto Calvo; DF-FCEyN-UBA, Dr. Andrea Bragas; CONICET-CITEFA, Dr. Noemí Walsö De Reca; CITEI, INTI, Eng. Liliana Fraigi; FI-UBA, Dr. Stella Duhalde; CNEA-CAC, Dr. Ana Llois; INIFTA-La Plata, Dr. Roberto Salvarezza; INTEC, Sta. Fe, Dr. Roberto Koropecski; Universidad Nacional de Entre Ríos, Dr. Fabio Guarnieri; Universidad de Río Cuarto, Dr. Diego Acevedo; FAMAF-Córdoba, Dr. Horacio Pastawski; CAB-CNEA, Dr. Roberto Zysler; CAB-CNEA, Dr. Hernán Pastoriza and Dr. Francisco de la Cruz.

<sup>4</sup> 1 US\$=3 Argentine Pesos.

<sup>5</sup> Type II PAV: network consisting of at least three research group nodes, belonging to one or more beneficiary institutions, the units of which are located at three different provinces.

<sup>6</sup> UN (Universidad Nacional=National University); UNL (Universidad Nacional del Litoral); CNEA (Comisión Nacional de Energía Atómica=Atomic Energy National Committee); CAC (Centro Atómico Constituyentes); CONICET (Consejo Nacional de Investigaciones Científicas y Técnicas=National Council of Technical and

“Bionanostructure self-organization for molecular information transmission on neurobiology and biological processes”, with \$893,694 (UN of Córdoba and CIQUIBIC, UN of San Luis, UN of Tucumán-CONICET); “Nanotechnology and nanoscience Argentine network: nanosystems and nanostructured materials (MaN)”, with \$899,959 (CNEA-CAB, CNEA-CAB, UBA, CONICET, UN of San Luis); and “Interface, ultramolecular, and molecular nanotechnology and nanoscience Argentine network”, with \$861,560 (UN of Río Cuarto, UN of Córdoba, CNEA-CAC, CONICET-UNLP, UBA, UN of San Luis, CNEA-CAB). These four projects are the four N&N networks publicly financed and recognized until mid 2007 in Argentina. Such networks involve about two hundred researchers (Balseiro, 2007).

### Nanotechnology Argentine Networks

PAV 2004. Nanotechnology. Financed Networks.

Network laboratory for designing, simulating and manufacturing nano and micro appliances, prototypes and samples.	UN of Entre Ríos. CNEA-CAC. CNEA-CAB. CONICET-UNL. UN of Nordeste.	Grant Total Amount: \$ 898709	<p>◆ Nano &amp; micro device Network. ▲ Interface, Ultramolecular &amp; molecular Network. □ Self-organization of Bionanostructures Network. ○ MaN Network.</p>
Bionanostructure self-organization for transmission of biological process and neurobiology molecular information.	UN of Córdoba- CIQUIBIC. UN of San Luis. UN of Tucumán- CONICET	Grant Total Amount: \$ 893694	
Nanotechnology and Nanoscience Argentine Network: nanosystems and nanostructured materials (MaN).	CNEA-CAB. CNEA-CAC. UBA. CONICET. UN of San Luis.	Grant Total Amount: \$ 899959	
Interface, Ultramolecular, and molecular Nanotechnology and Nanoscience Argentine Network.	UN of Río Cuarto. UN of Córdoba. CNEA-CAC. CNEA-CAB. UNLP-CONICET. UBA. UN of San Luis.	Grant Total Amount: \$ 861580	

Note: during 2006 and 2007 other groups have joined to the already existing networks, including other knowledge branches such as the Drug Targeting Strategy Design Laboratory of the Universidad de Quilmes, in Buenos Aires, which performs researches on nanomedicine; therefore, the chart may not be updated.

On November 5, 2004, the then Minister of Economy and Production of the Nation, Roberto Lavagna, at the 40th IDEA Annual Colloquy said that “a month ago we have started working at a relevant program in Argentina concerning nanotechnology”, while at the same time he specified that “Lucent Technology” multinational company enthusiastically accepted the invitation from the Ministry of Economy and Production to pose a nanotechnology development and support program in Argentina”, highlighting that “nanotechnology main

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Scientific Investigations); CIQUIBIC (Centro de Investigaciones en Química Biológica de Córdoba=Biological Chemistry Research Center of Cordoba); UNLP (Universidad Nacional de La Plata=National University of La Plata); UBA (Universidad de Buenos Aires=University of Buenos Aires); CAB (Centro Atómico Bariloche=Bariloche Atomic Center).

areas are: medicine, optics, car industry, capital goods, communications and computer science”. He remarked that “they represent future stakes that shouldn’t be left aside by our country” pointing out, as for the program contents, that “every clean room intended to produce nanotechnology costs 400 million dollars”<sup>7</sup> but he remarked that “as from this agreement, Lucent clean rooms will be used” (Lavagna, 2004a).

On November 25 and 26, 2004, the SeCyT, together with representatives of the European Union carried out a Meeting, in Buenos Aires, in order to promote the national capacities at the N&Ns area, achieving links through research programs and European networks.<sup>8</sup>

The same year, in December, the Minister told the press that “as regards science and technology, money means just a part”, saying that a program intended for the N&N development had just been launched. Faced with the question of why a strong budget increase does not assure a greater growth in matters of science and technology, Lavagna said that “it may be just restricted to the salary payment. Or, as it did happen to me the other day during a meeting with a group of scientists: someone, very proud, pointed out that they were manufacturing... aspirins. ¿Can you see the point? It shouldn’t be so. That is a misused public fund”. Thus ratifying his position in the sense that “they are programs which require political decision and coordination rather than a lot of money. As regards nanotechnology, the initial supply included in the budget amounts to around two million pesos. Nevertheless, with such two million pesos we are summoning the attendance of one of the most import companies worldwide on such matter” (Lavagna, 2004b).

Several people questioned the Minister because of his statements:<sup>9</sup> “Lucent represents everything except the best example of a successful company. Its history, linked to that of Bell laboratories, is full of unlawful acts — connected, for example, to Enron fraud, collapses and errors. To become convinced, you may read the book by Lisa Endlich *Optical Illusions: Lucent and the Crash of Telecom*”. Or just read any of those “articles shown in Google’s searcher if you write, for example, two magically connected words such as «Lucent» and «troubles»”.

The State, through Decree N° 380/2005 signed by President Néstor Kirchner, together with Ministers Alberto A. Fernández, Roberto Lavagna and Daniel Filmus, quoted in the Official Bulletin N° 30.643 as of April 29, 2005, authorized the “Ministry of Economy and Production to create the Nanotechnology Argentine Foundation (FAN)” (sec. 1), where “the National State within such Foundation mentioned under Section 1o of this Decree will be represented by the Ministry of Economy and Production” (sec. 2), as long as this Ministry is authorized to appoint the representatives as stipulated under FAN statute (sec. 3). A \$12,000 amount (sec. 4) was made available to implement those acts intending to achieve FAN’s goals (sec. 5). According to sec. 6 “Be it communicated, published, and delivered to the Dirección Nacional del Registro Oficial (National Department of the Official Registry) and be it filed” (FAN, 2005).

The Decree creating the FAN, together with the statements of Minister Lavagna, brought up the critical attention of different sectors involved. In a report from the board of directors of the Asociación Física Argentina (AFA, 2005) it was said that,

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<sup>7</sup> Class 1 clean rooms cost (they are the best, with less than 1 particle over 0.5 micron per air cubic foot) amount to around US\$ 5000 for each 0.0929 m<sup>2</sup>. Budget provided by the Minister of Economy is equivalent to a 7432 m<sup>2</sup> room of such quality, which represents almost the double of size being used by most companies devoted to microelectronic production.

<sup>8</sup> See [http://www.secyt.gov.ar/coopinter\\_archivos/multilateral/ue\\_taller\\_nanotecn.htm](http://www.secyt.gov.ar/coopinter_archivos/multilateral/ue_taller_nanotecn.htm).

<sup>9</sup> Dr. F. Schaposnik has written about Lavagna’s statements and the relevance of such company, as well as about the disciplinary field lobby (<http://www.fschaposnik.com.ar>, Postgrad Course “*Introduction to Scientific Knowledge Methods*”, 1st. Semester, 2005). In such course, the book by Endlich, Lisa (2004). *Optical Illusions : Lucent and the Crash of Telecom* is quoted. New York: Simon and Schuster.

It is unclear if on such procedures used to create FAN those mechanisms specified by accrediting systems and project evaluation from the national scientific-technological systems have been met, as regulated by Law N° 25.467. We consider that such behavior is not consistent with the required transparency and seriousness which must guarantee an initiative that, due to its nature, arises the future expectations of our society which, obviously, is willing for development and tired of frustrations.

Furtherly, in addition to legal-technical statements, it was said that:

Nano and microscience and technology world is quite large; Argentina has researchers covering such items whose criterion and experience must be taken advantage of at the time of looking for and deciding which are going to be the most fitted niches to be developed (AFA, 2005).

Some comments concerning such Decree were published by the press, all of which agreed that it was a strengthening and supporting measure for the industrial sector. On *Clarín*, as of April 28, under the headline *Economy swaps debts against industrial investment*, it is reported that “Minister Roberto Lavagna announced yesterday a measure packet leading to encourage industry investments”, and within such measure packet those measures implemented through Decree 380 are included (Clarín, 2005). For *La Nación* within the measure packet announced to foster industry, “additionally, as from Decree 380, the creation of a foundation to support projects for nanotechnology development was approved” (La Nación, 2005a). On *El Comercio* it is reported that “10 million dollars are allocated to dubious foundation” (El Comercio, 2005). *Infobae* reports that “Lavagna announced initiatives for the industrial sector”, being they restricted to Decree 380 within this series of measures (Infobae, 2005).

From the Chamber of Representatives of the Nation there came voices opposing against the implementation of Decree 380. The then Representative for Santa Fe, Lilia Puig de Stubrin, headed the disagreement voice, and submitted a project requesting, on May 13, 2005 a report to the National Executive Power (PEN) to clarify certain items concerning FAN creation (Puig de Stubrin, et al. 2005a and 2005b). The request is based, among others, on the following

Some hours before Resolution 380/2005, authorizing the Ministry of Economy to create and integrate the Nanotechnology Argentine Foundation, was published in the Official Bulletin, it was ratified that such creation would be supported by an agreement with the Lucent-Bell company, and the creation of a board of directors presided by the Secretary of Industry and integrated by CNEA representatives and of such company, which would make available to Argentine researchers and staff training, design testing and other activities connected with its facilities. Such agreement would have been presumably managed by a researcher appointed by the Ministry of Economy as Dr. Smith. Among the Decree’s provisions, also as Annex I the National State pledges itself to supply ten million dollars during the first five years, in accordance with a Statement of Work which will be stipulated by an Administration Council which will run and manage the Foundation (Puig de Stubrin, et al, 2005a).

While being reported the concerns on

the unlawful creation - according to regulations ruling the production innovation, technology and science activities and through the Ministry of Economy and Production, without the intervention of the Secretary of Science and Technology and Production Innovation of the Ministry of Education, Science and Technology of the Nation- of the Foundation with funds from the National State, without being it known the criterion concerning its technical feasibility, from the body specialized on such matter” (Puig de Stubrin, et al, 2005b).

It should be noted that the first three items involved in the application (out of eleven) submitted to PEN, where it is asked whether “to implement Dec. 380/2005 all provisions stipulated under Law 25.467 concerning the objectives of scientific policy have been met”, it is required the knowledge of “every corresponding proceeding which gave rise to the creation of the Nanotechnology Argentine Foundation”, it is requested if “when stipulating the

National State provision to create FAN a similar sharing chance has been given to every possible domestic group for the scientific-technological system development and research, through public bid in order to finance projects which may have been satisfactorily appraised by peer-appraisers”, and as regards the statements of the Minister of Economy, the explanation of which were the main criteria as regards scientists selection and their previous links with Lucent-Bell company is requested.

On September 25, 2005 on *Página 12*, Andrea Ferrari published an article the heading of which was *The sea battle of the Argentine scientists (the American Navy finances research projects in our country)* (Ferrari, 2005a). This article gave rise to angry public controversy, apart from a “discussion on the difficult relationship between science and military power”. Therein it was stated that among the three involved projects, there was at least one related to nanotechnology. Thus, from another point of view, an ethical one, this knowledge branch regained conflicting and public characteristics. “Under the name «Nanomaterials for sensors» included under the official page of the Office of Naval Research of the United States of America (ONR) a joint Project started in 2004 together with the NRL (National Research Laboratories) and the Balseiro Institute on behalf of Argentina, which depends of the National Committee of Atomic Energy (CNEA)” is mentioned. Therefore, the activity concerning the goals intended for the scientific research within a peripheral country was discussed. The news emerged from the report request performed by Representative Puig de Stubrin, and those expressions against the scientific activity disconnected from any engagements going farther than the mere basic research project financings came out in no time (*Página 12*, 2005; Foladori, 2006).<sup>10</sup>

In 2005, the Ethical National Committee on Science and Technology (CECTE) in reply to the Argentine Physics Association which asked for the competence of “CECTE concerning the ethical aspects involved in the sanction of Decree 380/2005, relative to micro and nanotechnology development and application”, stated that,

Any decree allocating relevant amounts of Money to a Foundation created with no need of agreeing with the legal system would contrast with the structure so carefully designed by the Congress of the Argentine Nation [Law 25.467, Innovation, Technology and Science Framework Law] as an evident damage against the equality principle, so highly valued ethically and legally (CECTE, 2005a).

Concluding that the CECTE “recommends that, either in this case or any other where public powers intend to promote scientific and/or technological research, the guidelines of Law 25.467 are also followed so as to assure that decisions advance on solid ethical bases”. Under the request of the SeCyT, the CECTE studied the issue concerning the technological and scientific research performed at public institutions financed by funds from the Office of Naval Research of the United States of America”. The CECTE considered that “this case starts an important discussion to analyze the relationships among science, society and state”. For such purpose, a four-relevant-item document was made, which may be consulted within network. (CECTE, 2005a and 2005b).

At the end of 2005, the SeCyT organized a joint meeting with the Max Planck partnership (Germany) where an important cooperation program between German and Argentine scientists at the N&N, Biosciences and Complex Criminality areas was announced (la Nación, 2005b; SeCyT, 2005).

In August, 2006, “the Minister of Economy and Production, Felisa Miceli, put into operation [...] the Advisory Council of the Nanotechnology Argentine Foundation, an entity presided by herself, and who will set up and promote the development of nanosciences and

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<sup>10</sup> These facts have had other consequences at CAB; for further details, see <http://www.rionegro.com.ar/arch200603/23/m23j77.php> , <http://www.rionegro.com.ar/arch200603/24/r24j10.php> .

micro and nanotechnologies in our country” (SeCyT, 2006); and opened a sharing chance for various companies, unlike her predecessor, linked to a single company.

The Ministry of Economy created the Nanotechnology Argentine Foundation, when Roberto Lavagna was the Minister of the Finance office. As stated by Lidia Rodríguez, current vocal of the Foundation and advisor of the Ministry, such initiative had been fostered by the Lucent Technology company, to obtain the financing of an exclusive product of such company (currently Alcatel-Lucent) (Premici, 2007).

FAN Advisory Council will be integrated by: Alberto Lamagna (CNEA) as president, Dr. Ernesto Julio Calvo (SeCyT-UBA) as secretary, Dr. Joaquín Valdez (INTI), Ricardo Sagarzazu (INVAP), Dr. Roberto Carlos Salvarezza (CONICET), Bach. Alberto Ridner (CONAE) and Eng. Adolfo Cerioni (INTA) as members.

In a radio broadcasting program it is stated that “to accept and correct mistakes always represents a positive attitude. It is also applied to science management, and this occurred within nanotechnology field”, referring to such discussion which emerged as regards the allocation of resources to a single research group linked to a single company (Argentine Science on Show window, 2006).

In August, 2006, the Government announced the opening of the first bid for financing initiatives on nanotechnology within FAN program framework leading directly to production innovation or improvement, as pointed out during the press conference following the meeting headed by the President of the Nation with the Nanotechnology Argentine Foundation and officers from the economic office, such as the Minister of Economy and Production Felisa Miceli, the secretary of Industry Miguel Peirano and, representatives of the secretaries related to technological and scientific research. During such press conference, offered by Minister Miceli and FAN’s treasurer, Dr. Lino Baraño, FAN scopes were explained: “As you already know, last year, by means of a Decree, the Nanotechnology Argentine Foundation was created, where the Minister of Economy is in charge of managing such Foundation and since I started my management we have developed the implementation of this advisory council, the working plan”, said Miceli. The coming into effect of an idea-project bid was announced, opened between 7 August, 2006 and 31 October, 2006, where “the evaluation of projects submitted will be in charge of the Foundation advisory council, integrated by the representatives of every public body having technological research competence and of the University of Buenos Aires as well. Let me also tell you that, from the Foundation, financing to carry out all those feasible projects will range between 50 and 80 per cent, up to a maximum of 2 million dollars”, said the Minister. While Baraño said, among other things, that the intention through FAN, is “to provide a different financing instrument, specifically aiming to apply such knowledge [on nanotechnology] to the development of new products or services, being the basis for new companies or enabling to increase the productivity of the already existing companies”. He later explained that it is “a process with a net production approach and it is thus developed within the Ministry of Economy environment and not within the Education, Science and Technology environment”. And that “this model, if successful, may be extrapolated to other knowledge areas after the management we intend to provide, a more flexible and dynamic management, maybe even more close to a business management of funds, i.e., the typical management of public funds for research and it would enable, in the short term, to achieve sound results to validate this new way of financing the scientific-technological activity” (Presidency of the Argentine Nation, 2006).

On a document used to promote the submission of ideas-projects, which may be found under the pages of the FAN and of the Ministry of Science and Technology of Brazil as well, the “FAN Messages” are read to the research groups: “Excellence within nanoscience environment shall be translated into marketable feasible products and processes” and to

companies: “To think “in small proportions” will increase revenues in big proportions” (FAN, s/f a).

On 4 August, 2006, the Minister of Economy and Production Felisa Miceli, the Minister of Education Daniel Filmus, the Secretary of Economic Policy Oscar Tangelson and the BID Representative Daniel Oliveira, offered a conference on the “BID support to finance Science and Technology Programs”. Miceli said that “the subscription of a Decree approving a 280 million dollar financing granted by BID to Argentina in order to finance science and technology programs was becoming real”. Filmus, on the other hand, said that “they are 280 million dollars granted by BID and, together with the Argentine counterpart,<sup>11</sup> represents the most relevant investment ever made by Argentina within the last few decades as regards science and technology”. He also added that “such investments are going to be used not only for the development of national research centers and institutes [...] but at the same time an important portion of it, through credits and grants, and even through private bank participation, is going to reach such companies intending to carry out developments and innovations related to production improvement. Oliveira stated that “it is a highly relevant project aiming to a modern country being able to insert itself within the international fashionable markets and achieve a long term sound development, based upon knowledge” (MECON, 2006).

FAN Management Council ratified the recommendation performed by the Advisory Council, authorizing to step to the «Project Formulation» stage to those Ideas-Project submitted by the following companies/institutions: Darmex S.A., Renacity Investment S.A., CONAE-INTI, Bell Export S.A., Fundación Instituto Leloir, Fundación Proteger, OVER S.R.L., CNEA-CONAE, Nanotek S.A. (FAN, s/f b). FAN has adopted a new reception system of Ideas-Projects, where “under such mode, the companies and/or institutions interested may submit their support applications whenever they have any interesting Idea-Project, with no dates beforehand specified” (FAN s/f c).

It might be said that once the first Ideas-Project selection for the possible fund granting has been achieved, FAN has started its cycle, which is closely connected to credit subscription by the State to governmentally foster the N&N field development. Such impulse, as it may be seen, has been mediated by a lot of interests (economical, political, ideological, technological, scientific, academic, socio-cultural, and so on), and it has involved conflicting times among the interacting and involved parties, directly or indirectly. It should be noted that once the operation and implementation arguments were overcome, there still remain various debates concerning the real impact on society, the clearance of lobbies in pursuit of solid benefits, the ecological-economical scopes of such benefits, among other aspects. Such debates and reflections have not been at least visible under this primary impulse aiming to the development of such a new and latest area; nevertheless, at the *Nano-Mercosur Meeting 2007*, organized by FAN in order to promote the relationship between science and enterprise and among MERCOSUR’s partners, they were as cautious as to include a first board on Nanotechnology and Environment (FAN, 2007).

### **Links between Argentina and Brazil on nanosciences and nanotechnologies**

From November 1 to 4, 2004, at the Sociedad Rural de Buenos Aires, the meeting “Science, Technology and Society” was held, promoted by the Asociación Argentina para el Progreso de las Ciencias (AAPC) [Argentine Association for Science Progress] and the Sociedad Brasileira para el Progreso de las Ciencias (SBPC) [Brazilian Society for Science

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<sup>11</sup> They amounted to 230 million dollars. It may be seen under <http://www.scidev.net/gateways/index.cfm?fuseaction=readitem&rgwid=1&item=News&itemid=3055&language=2&CFID=2704407&CFTOKEN=43613411>

Progress]. At the round table “Evaluation for the creation of a Nanotechnology and Nanoscience network for Mercosur” the moderators of which were Roberto Salvarezza (INIFTA, Ar), Oswaldo Luiz Alves (UNICAMP, Br), and Celso Pinto de Melo (UFPE, Br), participants from both countries discussed about

The need to promote scientific exchange, foster and perform technological and scientific research projects, aiming to solve mutual interest problems, grant scholarships, offer specialization courses, etc., and have a budget available for such purpose. As a result of the debate, unanimously agreed and approved by audience, the Argentine and Brazilian authorities were proposed to create a Nanoscience and Nanotechnology Binational Center” (Salvarezza et al, 2004).

That very day (02/11/2004), “the Ministers of science and technology of Argentina and Brazil subscribed a cooperation agreement aiming to ease the exchange and promote integration”(La Nación.com, 2004), both officers considered that “the social and economical development in both countries depends upon growing, multiannual and non bureaucratic public investments on basic and applied science”, and that “it is necessary to increase the number of qualified human resources within all areas, which is essentially basic to encourage a productive innovation efficient system, without which the equitable and sustainable development levels will be hardly reached by the relative national companies” (La Nación, 2004).

In a meeting held at the Secretary of Science, Technology and Productive Innovation as of August 18, 2005 (Conicet, 2005; MCT, 2005), a task force integrated by J. Humberto Nicola, A. de Souza Mendes, J. d’Albuquerque e Castro, J. Dupont, on behalf of Brazil, and A. Menvielle, E. Calvo, A. Lamagna, A. Boselli and S. Bidart on behalf of Argentina, the work intending to achieve such center was deepened. “Such proposal was officially taken during the Third Meeting of the High Level Manager of both countries held on August 23 and 24 in Brasilia. The goals of the future Centro Brasileiro-Argentino de Nanotecnología (CBAN)<sup>12</sup>[Argentine-Brazilian Center of Nanotechnology] were therein stipulated and an activity program was defined” (Conicet, 2005; MCT, 2005). Finally, on November 30, 2005, on the Argentine-Brazilian Friendship Day, at Foz de Iguazu, the governments from Brazil and Argentina subscribed the protocol to create the CBAN.

According to this protocol, the center has the following goals: promote the exchange and transfer of technological and scientific knowledge, the creation and training of human resources in both countries; create and perform, through research cores, development and research projects addressed to provide knowledge, products and processes and support to social and/or economical interest laboratories for both countries; perform studies and operational mechanism proposals to integrate the private and public sectors, fostering the creation of bi-national employments for manufacturing nanotechnological processes and products; and, to study issues concerning patents, industrial right and copyright for nanotechnological processes and products marketing.

The Center structure consists of the Argentina-Brazil High Level Manager-Committee, the National Coordinators, a Bi-national Advisory Committee and an Executive Secretary in each country. The National Coordinators have to execute the Center Management and periodically perform the Work Program on Nanotechnology and Nanosciences, which shall be sent to the High Level Manager-Committee. The Advisory Committee has to propose projects and share the evaluation of Work Programs adopted by the Center. Protocol additionally stipulates that both Governments will contribute, by equal parts, to finance the CBAN Work Programs.

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<sup>12</sup> In Argentina the center was known as: Centro Argentino Brasileño de Nanociencia y Nanotecnología, CABNN [Argentine Brazilian Center of Nanotechnology and Nanoscience].

In 2006, the Brazilian (Profs. Jairton Dupont and José d'Albuquerque e Castro) and Argentine (Profs. Ernesto Calvo and Alberto Lamaña) Coordinators were appointed by their relative Governments.

Between 2005 and 2006, the CBAN held the Seminar "Nanotechnology and Enterprises" in Buenos Aires (from 21 to 25 November, 2005), with the attendance of scientists and representatives from companies of both countries, and, the "Nanoparticle School", performed in Buenos Aires (from 25 May to 7 June, 2006). This school was attended by 60 students, 44 from Argentina, 13 from Brazil, two from Chile and one from Uruguay (CABNN, s/f).

The Centro Argentino-Brasileño de Nanociencia y Nanotecnología performed, on 6 and 7 August, 2007, a Work Meeting on the various areas covering the Nanotechnology and Nanoscience activity. It was attended by 40 experts from Argentina and Brazil, being its purpose to deepen the interaction between researchers and technologists and intensify the cooperation activities between both countries (CABNN, s/f).

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