Creation and establishment of the IEA in São Carlos

Sérgio Mascarenhas and
Yvonne Primerano Mascarenhas

Creation

THE GENESIS of the creation of the Institute of Advanced Studies (IEA) at the University of São Carlos involves Sergio Mascarenhas' sojourn as a fellow at the Institute for Advanced Study (IAS) at Princeton, United States, in 1996, and his participation for about 12 years as director of the Course of Biophysics and Medical Physics at the International Center for Theoretical Physics (ICTP) in Trieste, Italy, at the invitation of Abdus Salam, Nobel Laureate in Physics in 1979, until Salam's death in 1996. Sérgio Mascarenhas was convinced that both the ICTP and the IAS models could apply to Latin America with great advantages, due to the similarity of language, problems, and cultural, sociopolitical and economic conditions of the countries in the region. Still in the United States, he contacted various agencies, such as the Ford, Guggenheim and Rockefeller foundations, seeking support for what he had dubbed Program of Innovation and Studies for Latin America (*Programa de Inovação e Estudos para a América Latina* - Pieapal).

A positive response was received from the Ford Foundation through the strong support of Dr. Joan Dassin, director of Programs for Latin America and the Caribbean at that institution. Dr. Dassin was well familiarized with Brazil, where she had been program director for the Ford Foundation, and culturally identified with the country. Upon his return to Brazil, having obtained an initial grant from Ford, Sérgio Mascarenhas approached Prof. Flávio Fava de Morais, President of the University of São Paulo (USP), with a proposal to establish the Pieapal at USP-São Carlos. Prof. Fava, with his characteristic enthusiasm and vision, suggested that the Pieapal should be established within the scope of a new IEA center in São Carlos. It was a gift on a silver platter!

Subsequent contacts with the director of the IEA on USP campus in São Paulo, Prof. Umberto Giuseppe Cordani, led to the support and encouragement of its director to the creation of the center in São Carlos. The same support was offered by all the directors of local units: the Institute of Physics, the Institute of Chemistry, the Institute of Mathematics and Computer Science, and the School of Engineering of São Carlos, all of them members of the Campus Board.

All this support resulted in the institutionalization of the agreement with

the Ford Foundation, and all directors on campus agreed to prioritize the construction of a small physical space to house the IEA-SC, which would be shared with the USP Radio station. At that stage, the support of the administration of São Carlos campus was critical, as it temporarily housed the IEA-SC until the completion of the 100 square meters facilities which, although meager, gave body and soul to the IEA-SC, with a small 40-seat auditorium and four small rooms that housed an administrative office, a library and faculty offices.

Initial activities

The grant from Ford Foundation enabled carrying out three activities prioritized according to their potential impact at the regional level.

The first activity, of an educational nature, involved the important contribution of the Center for Scientific and Cultural Diffusion (*Centro de Difusão Científica e Cultural* - CDCC), an inter-unity body on the USP campus in São Carlos, which guided the educational and pedagogical activities of the project both in Brazil and in Argentina, in the area of science teaching for primary school children, addressing the important issue of Environmental Education. The Pieapal Program (Ford Foundation and IEASC-USP - São Carlos, included the *Educar* (Educate) Program in the Mutual Collaboration projects signed on September 7, 2000.

Participating institutions: La Casa de las Ciencias (UNC in Cordoba); Center for Scientific and Cultural Diffusion (USP - São Carlos); and state schools in both countries. The methodology used had already been well developed at the CDCC and was transferred and adapted to the social and pedagogical conditions of the counterpart school in Cordoba, Argentina, namely State School Bispo Gastão in São Carlos and Escuela Gobernador Alvarez in Cordoba. At the end of this collaboration, which spanned about 18 months, an online book was produced (in Portuguese and Spanish), entitled "*O estudo de bacias hidrográficas: uma estratégia para educação ambiental*" (The study of watersheds: a strategy for environmental education), as well as a printed version.

During the project, the First and Second Congresos Ibero-Americano de Educación em Ciencia Experimentales (Iberian-American Congresses of Education in Experimental Sciences) were held in São Carlos and Cordoba, respectively, with the participation of several Brazilian and Argentine members. On those occasions, the results obtained up to that time were published and new activities incorporated. Some moments of the congresses and participating members are described below.

• *Regional Workshop – March 1 – 5, 1999 - Project: "Educação e Sociedade: Melhoria do Ensino Básico de Ciências na América Latina (Education and Society: Improving the Basic Teaching of Sciences in Latin America) - Program: Pieapal – support: Ford Foundation. Workshop participants included professors Horácio Panepucci (director of IFSC/USP); Regina Helena P. Francisco (IQSC/USP); Eduardo Miguel González (coordinator of the Cordoba Group); Dietrich Schiel (director of CDCC/USP); Sérgio Mascarenhas (Pieapal director and coordinator of IEASC/USP); and João Batista Gasparini (representative of the Education*

delegate of São Carlos). The roundtable "O Papel da Universidade na Transformação da Educação" (The Role of the University in Transforming Education) was attended by professors José Alberto Riveros (president of the Consejo Directivo del Conicor); Myriam Krasilchik (director of the School of Education, USP); Jorge Daniel Perez (Minister of Education and Culture of the Province of Cordoba); José Galizia Tundisi (Secretary of Science and Technology of São Carlos); and Yvonne Primerano Mascarenhas (deputy coordinator of the IEA).

The workshop included sections on the Exchange of Educational Experiences such as "*Física - Experimentoteca*" (Experiments in Physics) - Hilton Koiti Sato and the Cordoba Group with professors Eduardo Miguel Gonzalez and Adriana Ferreyra.

• II Iberian-American Congress on Education in Experimental Sciences, held in Cordoba, Argentina, from 5 to 8 September 2000, organized by the National University of Cordoba, the National University of Rio Quarto and the University of Alcalá, in Spain.

In the Congress featured a presentation by Professor Alberto Sasson: "*O ensino das ciências no início do século XXI: desafios e perspectives*" (The teaching of science in the early twenty-first century: challenges and perspectives), and another by professor Daniel Gil Perez, Univesity of Valencia (Spanish) (Science for all? Some obstacles and measures to be adopted in the light of educational research).

The following roundtables were held: "*Canais de ligação entre a Universidade e o meio*" (Channels between the University and the environment), with the participation of Carlos Debandi (Cordoba Science Agency, Argentina); Daniel Lescano (Trasyt. UNC, Argentina);Silvia Etchegaray (UNRC, Argentina); Virginia Vargas (UMSS, Bolivia); Adriana Ferreyra (UNC, Argentina); and Yvonne P. Mascarenhas (IEASC - USP, Brazil); and "*Divulgação e popularização*" (Dissemination and popularization), with Maria Teresa Ferrero Roqué (UNC);, Miguel Ángel Gómez Crespo (Madrid, Spain); Graciela Merino (UNLP, Argentina); Alicia Baraibar (MEC, Uruguay); and Dietrich Schiel (CDCC/USP - Brazil).

This collaboration, which spanned about three years, led to the production of an online book (in Portuguese and Spanish): *Educação e sociedade: melhoria do ensino básico de ciências na América Latina* (Education and society: improving teaching basic sciences in Latin America) *(*Pilot Case - São Carlos (Brazil) - Cordoba (Argentina)*)*, and *O estudo de bacias hidrográficas: uma estratégia para educação ambiental (*The study of watersheds: a strategy for environmental education*)*, organized and published by Dietrich Schiel, Sérgio Mascarenhas, Nora Valeiras and Silvia A. M. dos Santos.

Final considerations

The activities were carried out with extensive online exchange of messages between students and faculty members from both institutions, visits of Argentine researchers from Cordoba to São Carlos, and of Brazilian researchers to

Cordoba, generating opportunities for very enriching experiences. These links established through exchanges between students, professors and government officials of the two Latin American countries clearly show how much can be done in this type of regional integration through the scientific and cultural education of children and youth.

An educational and scientific dissemination program was organized for a network of Science Centers and Museums in Latin America, in partnership with the Science Station of São Paulo, at the time headed by Professors Ernesto Hamburger and Silvério Crestana.

We succeeded in bringing together in a congress almost all major Science Centers and Museums in Latin America, as well as in publishing a large book with the contributions of all participants, which led to the proposal for an Integrated Project of Science Centers and Museums for Latin America, to be presented to the IDB and local funding agencies. We believe that was a historic and long lasting initiative that can be measured by the growth of the network of science centers and museums in Latin America since the congress. These activities resulted in the publication of the book *Centros e museus de Ciência – visões e experiências* (Science Centers and Museums - visions and experiences), organized by Silvério Crestana, Miriam Goldman de Castro and Gilson R. de M. Pereira.

The second activity was chosen because of the previous experience of several researchers in São Carlos, from both USP and UFSCar, including Yvonne P. Mascarenhas, with experience in ceramics technology and projects supported by Petrobras, CNPq and Fapesp. Another important factor was the existence in São Carlos of the Technological Park of São Carlos (ParqTec), directed by Silvio Rosa, a retired professor from the IFSC, who had a good idea of the stage of development of the regional ceramics industry. At the same time, a theme project called "*Materiais ferroelétricos: fenomenologia, propriedades e caracterização*" (Ferroelectric Materials: Phenomenology, Properties and Characterization) was under development, coordinated by Yvonne P. Mascarenhas and involving researchers from USP/SC and UFSCar, which was later supported by Fapesp. For all these reasons, the decision was made to hold a workshop on ceramic materials using the Ford Foundation grant. This workshop was attended by researchers from São Paulo, Paraná, Goiás and Minas Gerais.

Current structure

After this first phase of the Ford-Pieapal-IEA-SC project, the IEA-SC was organized in a more permanently fashion through Working Groups (WG), with well planned missions and their respective Thematic Action Plans. Each working group was comprised of a coordinator who could add other researchers from USP or other institutions and seek funds in other public and/or private funding agencies.

However, it should be noted that the institutionalization of the IEA at São Carlos only occurred in 2009, with the corresponding amendments to the

USP statute and the IEA bylaws. As a result, the IEA in the campuses of São Carlos, Ribeirão Preto and Piracicaba were renamed Centers, to be managed by a coordinator. Professor Roberto Faria, former director of the IFSC, was appointed coordinator of the Center after consultation with all unit directors on São Carlos campus, who submitted a list of names to the Advisory Board of the IEA which, in turn, prepared a three-name list that was submitted to the Office of the USP Dean. Prof. Sérgio Mascarenhas was then appointed deputy coordinator of Projects by the current coordinator, and Prof. Yvonne P. Mascarenhas was the deputy coordinator for administrative issues.

The needs for administrative services at the IEA-SC have been met from the start by two official technical level secretariats, thus allowing the IEA-SC to operate in compliance with procedural requirements, as well as with those arising from the WG activities with their members, networks and public and private agencies, including reports, accountability, and communication by post or online. Financial activities involving USP resources to be carried out by the IEA-SC were located at the campus administrative office, currently the Administrative Coordinating Office of the São Carlos campus.

Successive IEA directors have always had an attitude of support and encouragement, as well as all deans who have led the University from 1997 to the present.

Taking into account the human resources potential existing on the two university campuses (UFSCar and USP), in the two Research Centers of Embrapa and in some technology-based companies in the region of São Carlos, several Working Groups were established even before the institutionalization which, through sporadic events like conferences, seminars and workshops have contributed to the survey and discussion of broad topics of general interest on the São Carlos campus of USP, or even established medium or long term research programs. The decision was then made to address topics of importance to the solution of the chronic problems of Latin America. Among these problems is Primary and Secondary Education, whose gravity is very well attested by poor results in evaluations conducted by international organizations, and Agriculture and Agribusiness, which are critical to economy (one-third of GDP) and to the health of the Brazilian people through access to good quality food.

Working groups
Coordination of IEA-SC projects

Mission: to structure, support and guide actions arising from research projects and relationships with municipal, state and federal development agencies, as well as international contacts - initial coordinator from 1997 to 2011: Prof. Sérgio Mascarenhas.

Network for Technological Innovation and Prospecting for Agribusiness (Rede de Inovação e Prospecção Tecnológica para o Agronegócio - Ripa) and WG – coordinated by Silvio Crestana and Paulo Cruvinel, both researchers from CNPDIA/Embrapa.

Mission: to structure strategic programs for agribusiness in the five Brazilian regions (South, Southeast, Central-West, Northeast and North).

The project was developed with the support not only of Embrapa but primarily of FINEP, which funded the program for four years. This WG has had profound repercussions, and through the Delphi method for Collaborative Planning, succeeded in incorporating the results into government action plans. The nationwide Ripa Project has achieved its general objectives in the five regions of Brazil, as can be seen at www.Ripa.com.br. The contribution of this project was such that it mobilized more than one thousand researchers, business leaders and politicians at the three levels (federal, state and local), NGOs and other Brazilian society representatives. The final product is a database that ensures the various sectors of Brazilian agribusiness free access to valuable information.

The prospecting model has also been applied in São Carlos, in partnership with the city's Rural Union, and resulted in a paper published by Embrapa Agricultural Instrumentation addressing the productive chains of beekeeping, dairy cattle and goats.

Scientific dissemination with support for Education

Mission: to improve the quality of teaching and learning in public schools through University-Public School interaction and the use of multimedia resources.

Coordination: Prof. Yvonne P. Mascarenhas, with the important support of the CDCC.

Methodology:

a) To encourage the use of IT resources in public primary and secondary schools through the training of teachers and students and support for activities carried out with the help of university professors, primary and secondary teachers and undergraduate students, through both queries on the internet and experiments.

b) To establish a scientific dissemination agency called CienciaWeb, in which many subjects of interest consisting of topics produced for this target audience are posted on the portal www.cienciaweb. These topics are produced with the support of a professional journalist, university professors and public schools; journalism, image and sound students; and computer science and undergraduate mathematics and science students.

c) To use the resources available at the CienciaWeb agency as a vehicle for the dissemination of results that are of greater interest to our target audience and to the general population, achieved by researchers from the Organic Electronics INCT of IFSC/USP, and of the Capes NanoBioTec-Brazil network, in particular the NanoBioMed subnet hosted at IFSC / USP.

d) To organize two two-day seminars on Scientific Dissemination. The first to be held in October 2010 on the topic "Using scientific dissemination as an educational resource", with the participation of professionals from the area and educators, and the second on the topic "Challenges of scientific communication",

to be held in October 2011. The first CienciaWeb seminar on "Scientific dissemination as a source of education" aimed to reinforce the importance of scientific dissemination in our society, in order to contribute to improving and upgrading the teaching of science, disseminating the topic in the media in our region, and stimulating popular participation on topics common to the day to day of education. The seminar had 143 registrations, 90 participants, and was broadcast live on the internet with 142 hits. The agenda included focused lectures, roundtables and workshops. More information can be found at www.cienciaweb.com.br/ seminar.

e) Series of lectures for chemistry professors and the general public in celebration of the International Year of Chemistry (CNPq support).

The results of these events are quite encouraging, with good acceptance by the project partner schools, increased interest of professors and students, communications in congresses, publications and repercussions in the regional press, radio and TV. The recent publications and results presented during congresses are listed below:

a) XVI CONGRESS World Association for Educational Research. Monterrey - Mexico - June 31 to July 4, 2010, title of the symposium: "*O olhar da pesquisa em educação sobre o lugar e o papel dos saberes escolares disciplinares nas práticas docentes: consequências para o ensino e para a formação de professores* (The look of educational research on the place and role of school discipline knowledge in teaching practices: implications for teaching and teachers training); title of the communication: "The use of new technologies in the daily school practice: learning motivation of students and teachers" by Neucideia Aparecida S. Colnago, Marina M. Massocco, Yvonne P. Mascarenhas and Rita C. Bortoletto-Santos.

b) ED-Media 2011 World Conference on Educational Multimedia, Hypermedia and Telecommunication. Lisbon, Portugal, June 27-July 1, 2011. Title of communication: "Use of Multimedia to Improve Brazilian Public School Students' Interest in Science", by Yvonne P. Mascarenhas, Neucideia A. Colnago, Rita C. Bortoletto-Santos and Valda Rock.

c) Colnago, N. A. S.; Bortoletto-Santos, R. C., Mascarenhas, Y. P. (2010). Digital Almanac – *Nosso Céu*. Available at: http://muraldaescola.wordpress.com/2010/10/29/almanaque-digital-%E2%80%9Cnosso-skyE%80%9D/#more-554 ;

d) Colnago, N. A. S.; Bortoletto-Santos, R. C.; Mascarenhas, Y. P. (2011). Digital Almanac – *Conhecendo e difundindo os benefícios do mel* (http://muraldaescola.files.wordpress.com/2011/02/cd-mel-final.pdf.

e) Colnago, N. A. S.; Bortoletto-Santos, R. C., S. Soares R. B., Cordeiro A. P. M.; Almeida R. S.; Mascarenhas, Y. P. (2011). II Multidisciplinary Digital Almanac: *Sustentabilidade - alternativa para o Futuro encontradas no Passado*. Available at: http://muraldaescola.files.wordpress.com/2011/02/ cd-sustentabilidade-final.pdf.

f) Rolfsen Belda, F.; Mascarenhas, Y. P. *Aprendizagem em ambientes e comunidades televisivas: uma experiência-piloto em colégios da rede estadual de ensino de São Carlos (SP). InterScience Place*, v.15, p.95-116, 2010.

Corporate universities

Coordinated by Prof. João Gomes de Oliveira, a professor at EASC, current director of the Institute for Technological Research (*Instituto de Pesquisas Tecnológicas* - IPT) and coordinator of the MCT National Institute of Science and Technology called Millennium Factory Institute, located at the Department of Production of EESC/USP. The general objectives of the Millennium Factory Institute (*Instituto Fábrica do Milênio* - IFM) can be understood as the proposition, development and dissemination of mechanisms to increase competitiveness of the scientific and technological knowledge of manufacturing industries, especially capital goods industries established in the country. At first glance, these objectives may seem too comprehensive and pretentious. However, the set of institutions and projects involved make up a critical mass that enables it to develop a range of research (ranging from the development of basic industrial technologies to management elements) which, if organized in an integrated manner can contribute effectively to the development of Brazilian industries. Thus, the primary role of the IFM coordinating unit is to manage the integration of these projects and promote the dissemination of their results. Its interaction with the IEA-SC Center has occurred through the organization of lectures delivered by experts to discuss and disseminate topics in their research area.

Environment

Coordinated by Prof. José Galizia Tundisi, a retired EESC professor, director of the International Institute of Ecology and a Brazilian researcher of international renown, with great interest in education. In his interaction with the IEA, it should be noted that he not only conducted research and innovation activities in the area, but also cooperated actively in the Watershed program. This year he collaborated with the WG on Scientific Diffusion in Support of Education by delivering a lecture in the celebratory program "*CienciaWeb no ano Internacional da Química"* (CienciaWeb in the International Year of Chemistry) linked to the topic " *A química e a vida no Planeta Terra: implicações da contaminação dos recursos hídricos na qualidade da água e na biodiversidade*" (Chemistry and life on Planet Earth: implications of contamination of water resources in water quality and biodiversity".

Spatial aviation

Coordinated by Prof. Fernando Martini Catalano, from the Department of Aviation Engineering/EESC/USP, this WG supported cooperation agreements with the CTA of São José dos Campos through an agreement with the EESC Department of Aeronautics for the construction of an ultrasonic tunnel

in cooperation with the CTA Institute of Advanced Studies. This WG counted on the participation of the Brazilian astronaut Marcos Pontes.

Information Technology

Coordinated by Prof. José Carlos Maldonado, a professor at ICMC/ USP and its current director, and coordinator of the National Institute of Science and Technology in Critical Embedded Systems (*Instituto Nacional de Ciência e Tecnologia em Sistemas Embarcados Críticos* - INCT-SEC), and Prof. Edson dos Santos Moreira, from ICMC-USP. This WG was established with the aim of raising the level of knowledge, competence and quality in the country on the development of critical embedded systems, considering that this technology is important to support the development of strategic areas of the country such environmental control, security and national defense, and agriculture. The relationship between academia and industry is heavily exploited in the development of solutions in these different fields, and the dissemination and spread of science in this and in many other areas is a paramount action. Among other activities, it should be noted that scientific dissemination is being currently conducted with the collaboration of the CienciaWeb Scientific Diffusion Agency of the IEA-SC Center, with great mutual benefits. The activities developed in partnership with the IEA/CienciaWeb include the implementation of the programs "*Eu Pesquiso*" (I Research), "*Quero Saber*" (I want to know) and "*De Cara com Feras*" (Face to Face with the Best), a lecture in the program CienciaWeb in the International Year of Chemistry, and support in organizing the II Seminar on Scientific Journalism to be held still in 2011.

Complex systems

Coordinated by Prof. Hamilton Varela from the IQSC/USP. The reductionist approach based on the construction of the whole from the sum of the parts has been increasingly challenged by problems posed by different areas of human knowledge. Concepts such as nonlinear dynamics, chaos, dynamic self-organization, spatiotemporal patterns and emerging properties have been used and proved useful in addressing problems in different fields. Incorporating the concept of complexity or the theoretical framework needed to deal with complex systems requires changing the focus of structures, quantity and reductionism for standards, quality and systemic view. The ability to handle the complex has become a pressing need in the virtually flat world in which we live. Relatively recent issues such as sustainable development, global warming, globalization and the role of networks in society involve hierarchical structures at various levels and emerging properties, and therefore cannot be discussed based on the existing reductionist concepts. Although routinely used in some specific problems, it can be stated that there are still few areas benefiting from the conceptual framework associated with complexity. In this context, the establishment of national and international networks has an essential role in the process of understanding and disseminating complexity, and therefore as a possible alter-

native to the fragmented and isolated scenario that characterizes knowledge in the twenty-first century.

The Working Group on Complex Systems (GTSC) was established in December 2008 by professors Sérgio Mascarenhas, Yvonne Mascarenhas and Hamilton Varela (IQSC / USP). The general objectives of the GTSC include:

a) To foster interdisciplinary cooperation between different groups of basic and applied research, both public and private, in Brazil and abroad;

b) To study, correlate and disseminate, at different levels, the myriad of aspects associated with complex behavior in chemical, physical, biological, social and technological systems;

c) To implement a portal for the dissemination and popularization of complexity concepts, together with the CienciaWeb agency of the IEA-SC;

d) To establish a network of international cooperation with research groups and centers of excellence in different areas;

e) To serve as an initial cell for the possible nucleation of an International Center in Complex Systems.

One of the main contributions of the WGSC in the period was the organization of the 1st Workshop on Complex Systems (by the Working Group on Complex Systems of the IEA-SC). The event was held at the Institute of Chemistry of São Carlos on 3 and 4 August 2009, and featured speakers from various fields of knowledge and different learning and research institutions in Brazil. The full list of speakers includes: Roberto Luzzi (IF/UNICAMP), Rita Zorzenon (DF/UFPE), Marcos Buckeridge (IB/USP), Hamilton Varela (IQSC/ USP), Ivan Guerrini (UNESP), Marcelo Mazza (IEA-SC/USP), Roberto Berlinck (IQSC/USP), Wanderley dos Santos (IB/USP), Roberto Faria (IQ/UFRJ), Sérgio Mascarenhas (IEA-SC/USP), Roberto Kraenkel (IFT/UNESP), Gustavo Vilela (IFSC/USP) and Silvio Crestana (Embrapa). In addition to this event, several collaborations have been established, with emphasis on international action with the "Ertl Center for Electrochemistry and Catalysis" in the city of Gwangju, South Korea, and the Fritz Haber Institute in Berlin, Germany. Currently, the central focus of action of the WGSC is the preparation of a proposal for a course in Engineering of Complex Systems.

IEA-Embrapa

Coordinated by Dr. Paulo Cruvinel, a researcher at the CNPDIA, Embrapa.

The activities of this WG focused on the project "*Rede de Inovação e Prospecção Tecnológica para o Agronegócio*" (Network for Innovation and Technology Prospecting for Agribusiness - Ripa).

Fierce global competition requires of Brazilian agribusiness the instrumentalization of knowledge that anticipates the actions of competitors and enables prospecting opportunities and identifying bottlenecks. It is becoming increasingly difficult to meet challenge faced by developing countries in the attempt to

either follow the frontier of scientific development or strengthen their regional or sectoral S, T & I systems, or even to take advantage of the opportunities created by the advance of scientific and technological knowledge for socioeconomic development. Most central countries have increased the investment of public and private resources dedicated to the generation and dissemination of knowledge and to the creation and development of cooperation networks. This form of organization enables relaxing knowledge areas already established, building capacity to mobilize existing skills and assets in an institution, and setting up working groups needed to solve new problems. Thus, real time sharing and management of information on the advances achieved by researchers and organizations integrated into networks is seen as the best path to be followed. Similarly, the use of common physical infrastructure and resources for innovation and technology prospecting should be maximized. The ability to understand this environment and envision new opportunities and threats to Brazilian agribusiness is totally dependent upon a systematic program to monitor ad analyze data on the internal and external environment, and upon subsidies that provide a relative stability to the sector in a competitive environment, which is only possible through a system of Competitive and Strategic Intelligence for the sector.

General objectives of Ripa

• To conduct advanced studies and build a Network of Technological Innovation and Prospecting for Agribusiness;

• To create a collaborative environment that maximizes the channeling of tacit and explicit knowledge of the organizations;

• To integrate actions among government institutions, the productive sector, the third sector and the ST & I community;

• To support the Management Committee of the Sectoral Agribusiness Fund, policymakers and decision makers, as well as FINEP in setting priorities and promoting initiatives that involve strategic and competitive decisions that rely on technological innovation prospecting.

The project has been completed and its results can be found at www.Ripa.com.br.

Nanobiotechnology

Coordinated by Prof. Sérgio Mascarenhas, with the participation of L. C. Mattoso from the National Nanotechnology Laboratory for Agribusiness, Embrapa.

Its actions have led to the establishment of the Nanobiotec-Brazil Network with the support of Capes, which today supports 38 subnets in various areas of interest in Nanobiology and Nanobiotechnology throughout Brazil, with one of the subnets located at the IFSC, and conducts research on the topic of "Progress and Risks of Bionanotechnology in Medicine" (NanoBioMed). The subnet NanoBioMed is coordinated by professors Yvonne Primerano Mascarenhas and Valtencir Zucolotto from the IFSC-USP. Its activities are dissemi-

nated through the CienciaWeb portal, with special emphasis on interviews and results presented in its annual workshop.

Aiming to stimulate research in this area, this WG organized and held in Brazil, in 2010, the First International Congress on Bionanotechnology, in the city of Águas de São Pedro (state of São Paulo).

Organic semiconductors

Coordinated by Prof. Roberto Mendonça de Faria, a professor at the IFSC and its last director, and current coordinator of this Center. He is also the current coordinator of the National Institute of Science and Technology of CNPq, called the National Institute of Science and Technology in Organic Electronics (*Instituto Nacional de Ciência e Tecnologia de Eletrônica Orgânica* - INEO), a new frontier area in microelectronics of great significance to the future of the country in this strategic sector.

INEO has set up a national research network at the National Institute of Science and Technology, focused on research into electronic and optoelectronic devices, in which the active materials are organic semiconductor films that can be separated into two main types: synthetic polymers and small molecules, and natural polymers. The name organic semiconductor used herein comes from the similarity, in terms of electronic structure, between the molecules to be studied and traditional inorganic semiconductors. INEO's activities focus on different classes of organic, photo and/or electroactive materials. Research projects under INEO include the areas of organic synthesis; study of structural, optical and electrical properties; theory of transport in devices and electronic structure at the molecular level; processing; and possible device applications.

The activities of the WG at the IEA aim to use an environment conducive to the dissemination of its activities in academic communities and well as among faculty and students in the public education network and the general public, to encourage young people to choose scientific careers. To that end, it uses the CienciaWeb agency at the São Carlos Center of the IEA to cover lectures, interviews and events. Special mention should be made to the Annual Workshop, with the participation of most of its faculty members, and post-doctoral, masters and doctoral students.

Acknowledgement

We appreciate the dedicated effort of all employees and former employees of the IEA, São Carlos Center, as well as the support of the Coordinating Unit of the São Carlos – USP campus.

Sérgio Mascarenhas is a professor emeritus at IFSC/USP and project coordinator at the São Carlos Center of the IEA. @ – sergiomascarenhas28@gmail.com

Yvonne Primerano Mascarenhas is a professor at the IFSC/USP and administrative coordinator of the São Carlos Center of the IEA. @ – yvonne@if.sc.usp.br

Received on 19 Sep. 2011 and accepted on 25 Sep. 2011.