



Brazil & US Technology Open House

NIST, Gaithersburg, MD

30th June 2004

Enterprises:

1. *Area Química, São Paulo, SP*

Manufacturers of water proofing liquids and paints for houses and buildings and for educational and artistic use, Area Química will be presenting a new medium for artists, which resulted from research on fluidification of amorphous olefin polymers. The new product is based on synthetic waxes of highly fluid polymers and is suitable for “encryotic”, the denomination Area Química has given to the technique due to its similarity to encaustic and its working at room temperature.

2. *Bambusa, Alexânia, GO*

Manufacturers of cocktail sticks and toothpicks, Bambusa has innovated a chinese manufacturing process using bamboo, taking into account ecological and clean technology aspects that included the development of equipment and manufacturing process.

3. *Biolab, Taboão da Serra, SP*

A pharmaceutical company, Biolab Sanus has been working since 1997 on the project Polymeric Biomaterials – Advanced Bandages in partnership with the Nuclear and Energy Research Institute (IPEN). In 2002 the prototype of hydrogel bandages was ready; in 2004, the project may reach its goal, with product improvement after clinical trials. Other projects concerning the development of polymeric materials aimed to pharmaceutical uses are also in progress.

4. *Brapenta, São Paulo, SP*

Manufacturers of metal detectors for the safety, mining and food industry sectors and of dynamic weight controllers, Brapenta will present their development of metal detectors of high sensitivity for the food industry. Most industrial processes can be accidentally contaminated with magnetic and non magnetic particles that can break production machines or produce serious final consumer damages and loss of money and prestige to the producer; the challenge was to detect very small metal contamination, for example, 0,5 mm long non-magnetic stainless steel inside products with electrical conductivity such as sausages or metallic vitamins in corn flakes, applying magnetic fields.

5. *BUG – Agentes Biológicos, Piracicaba, SP*

BUG Biological Agents will present their biological control agents that are used in many different cultures such as sugar cane, maize and vegetables. They also produce pest insects to supply the demand of companies, research institutes and universities for product testing (agrochemical screening and bioassays), artificial infestation of plants in the field and greenhouses.

6. *Cluster de Alta Tecnologia de São Carlos, São Carlos, SP*

Bringing together eight enterprises (Ablevision.com, Async, Enalta, MZO, Radiumsystems.com, S&V, Yordan and Virgus), the São Carlos High Technology Cluster will present products and solutions based on free and open software for diverse applications: web based management of institutions and research and events networks, portals, e-learning, people flow control, security, manufacturing, automation and design systems, among others.

7. *D & L Welding, Columbus, OH, EUA*

A welding technology company, D& L Welding will present, together with the National Synchrotron Light laboratory, their project for the characterization of fumes generated during the welding and cutting of different materials, including plain carbon steels, stainless steels and aluminum, so that their knowledge can improve the welding working environment. For these studies, an electrical low pressure impactor (ELPI) is being used that allows welding fumes to be collected in various particle size ranges going down to as small as 0.01 microns in diameter.

8. *Dedini, Campinas, SP*

Manufacturers of alcohol distilling plants, Dedini has recently delivered their first biofuel plant; together with the National Reference Center for Biomass – CENBIO, Dedini will be presenting their DHR (Dedini Rapid Hydrolysis), a process using hydrolysis to convert sugar cane bagasse into sugars that, fermented and distilled, result in ethyl alcohol; main advantages of the process are reduced hydrolysis reaction time, higher yields, few unit operations, minimum investment and reduced operating costs.

9. *Ecovec, Belo Horizonte, MG*

Ecovec, a spin-off company from the Federal University of Minas Gerais, develops biotechnology products and solutions for monitoring and controlling insects and agriculture infestation; conducts research on behavior and attraction of various insects that are vectors of human and animal disease and it will be presenting mosquito traps and a data acquisition and processing system that allows quick identification of rapidly developing mosquito hot spots thus enabling quicker destruction of breeding sites.

10. *Electrocell, São Paulo, SP*

A small enterprise dedicated to the development of fuel cell systems and accessories, Electrocell will be presenting their fuel-cell unit series that can generate power in the range of 25 – 50 kilowatts.

11. *Eletronorte, Belém, PA*

A electrical power generating company located in the Amazon region, Eletronorte will be presenting, together with the National Reference Center for Biomass – CENBIO, their project for a fuel cell that uses hydrogen obtained from the reform of sugar cane ethanol vapor.

12. Embrapa, São Carlos, SP

Embrapa is a federal government R&D company that branches out all over Brazil; their São Carlos Laboratories have developed artificial taste sensors (also called “*electronic tongues*”) that are able to differentiate tastes of complex liquids, mimicking the human tongue.

13. Endoview, Salvador, BA

Manufacturers of medical equipment, with a wide range of products for videoendoscopy, will present their flexible videoscope for the high digestive tract, developed in partnership with the SENAI/CIMATEC Center, the State of Pernambuco Institute of Technology (ITEP) and the Physics Department of the Federal University of Pernambuco.

14. Exatron, Porto Alegre, RS

Manufacturers of products for power economy and electrical safety, Exatron will present their movement detector that uses an infrared sensor and their light sensitive microcontroller.

15. Fiberwork, Campinas, SP

A technology enterprise that develops innovative cost-effective fiber optic solutions for telecom and non-telecom markets, Fiberwork will present three of their products and services: the OSPA Optical S-Parameter Analyzer, the FWL Family of Optical Telephony Systems and Specialized Fiber Network Diagnostic Services.

16. Fibraforte, São José dos Campos, SP

Developers and manufacturers of mechanical systems for the space, aeronautical and automotive sectors, Fibraforte will be presenting, together with the National Institute of Space Research – INPE, their technology for depositing diamond like carbon (DLC) films on metals, for use in the solar generator of the Brazilian Multi-Mission Platform; movable parts, that have metal to metal contact, need to be protected to avoid cold welding in the space environment.

17. Flúidos da Amazônia, Belém, PA

Manufacturers of perfumes prepared with raw material from the Amazon region, will present their sustainable development project that uses material collected in the forest (tree barks, discarded wood, leaves, roots, seeds, flowers and fruits) and stimulates and promotes process efficiency, environmental quality, safety and good occupational health.

18. Getec, São Gonçalo, RJ

Manufacturers of sorbitol, manitol, maltitol and dextrose, GETEC will present their development and optimization of *Ni-Raney* catalysts for reactions of organic hydrogenation.

19. Gisplan, Rio de Janeiro, RJ

An enterprise specialized in systems for geographical information and remote sensing, as well as in software engineering, Gisplan, together with the National Institute of Space Research – INPE, will present their “Remote Sensing Multi Satellite Ground Station System”.

20. Hewlet Packard, Porto Alegre, RS

Providers of global technology solutions that include information technology infrastructure, personal computing, and equipment for access, global services, imaging and printing, HP will present their project, that takes advantage of the National Synchrotron Light Laboratory – LNLS capabilities in materials characterization, to study the implementation of solid state quantum computing using nanoscale crystals as basis for quantum dots. The theoretical studies have focused on the robustness of the quantum representation of solid state bits, i.e. the analysis of relevance of the diverse mechanisms that destroy the quantum nature of these bits. Experimental highlights were the design of evaporation chambers, radio frequency hardware running at 16GHz, and low signal electronics, which allows capacitance measurements with noise levels as low as 40×10^{-18} Farads.

21. Intermed, São Paulo, SP

Providers of solutions for mechanical ventilation and anesthesia, Intermed will present, in partnership with the São Paulo Institute of Technological Research – IPT, their development of a family of lung ventilators for use from premature babies to obese adult patients, both in invasive and non-invasive modes. The main objective of this project

22. Kraft Foods do Brasil, Curitiba, PR

Kraft Foods do Brasil S.A., manufacturers of powdered beverages, confectionery products and cream cheese, will be presenting their “Food Vocation Program” (*Universidade de Alimentos – UAL*) that, aiming at social improvement, qualifies new professionals to work not only at Kraft but also in other food industries of the Curitiba region. Their interaction with SENAI/CETSAM for technology programs on environmental management, water and effluent treatment, solid wastes and atmospheric emissions will be emphasized.

23. Mitutoyo Sul Americana Ltda., São Paulo, SP

Manufacturers of a wide range of measurement instruments and equipment, from gauge blocks and micrometers to coordinate measuring machines, they will present hardness standard blocks developed by INMETRO, INT and PUC-Rio whose technology is being transferred to Mitutoyo for fabrication and commercialization.

24. Parque Tecnológico de São Paulo, São Paulo, SP

The Technology Park of Sao Paulo takes advantage of the infra-structure for S&T&I development of the University of São Paulo and three research institutes located in the university campus (National Institute of Energy and Nuclear Research – IPEN, IPEN, São Paulo Institute of Technological Research – IPT and Butantan Institute); of the support an important research supporting foundation, FAPESP, and of the largest technology incubator in Brazil, CIETEC.

25. Petrobras/CENPES, Rio de Janeiro, RJ

Petrobras Research and Development Center coordinates all technology development needed by Petrobras, Brazil’s oil producing company. Its main investigation lines include exploration (very deep waters) and production, industrial research, basic engineering and analytical chemistry. Cenpes will present the Ocean laboratory, a deep water simulation tank, together with the Federal University of Rio de Janeiro, and a chemical process for producing DME (dimethyl ether) directly from the synthesis gas, together with the National Institute of Technology.

26. Polymar, Fortaleza, CE

A technology enterprise created and incubated at the Federal University of Ceará, in the northern-eastern region of Brazil, Polymar is specialized in producing biopolymers from crustacean shells (shrimp, lobster and crab) with technology patented in Brazil. Their major products, such as functional foods, food supplements and gels, membranes and bandages with incorporated chemicals will be presented.

27. Rhodia, Paulínia, SP

A large chemical industry, with several specialized branches, Rhodia will present their project, together with the National Synchrotron Light Laboratory – LNLS, for characterization of several types of advanced polymers which may be used as raw materials for several industrial applications; the project's goal is to elucidate these materials structure and link the information obtained to their properties.

28. Sabó, São Paulo, SP

Manufacturers of oil retainers, gaskets, hoses and mechanical seals, Sabó will present their technology for plasma surface treatment of PTFE discs and rings.

29. Sapiens S.A., Florianópolis, SC

Sapiens Park is a regional development project aimed at being a reference urban and environmental complex made up of scientific-technological, tourist, business and educational enterprises that seek to provide an unforgettable experience for visitors and clients through a group of distinct services, a special environment and a concept of learning integrated with entertainment and the application of technology.

30. Sima Consulting, São Paulo, SP

A knowledge-based enterprise, SIMA will present their integrated systems for strategic management of business and of scenarios.

31. Trilha Projects. Ltd., Rio de Janeiro, RJ

A small software enterprise, incubated at the National Technology Institute, Trilha will be presenting their See-The-Future (STF) technology, a finite capacity scheduling simulation tool which has acquired the capacity of becoming fully and precisely adherent to shop-floor needs of (re)planning and issuing production orders.

32. Visomes, São Paulo, SP

A calibration laboratory and manufacturers of thermostatic and cryostatic baths, climate chambers, laboratory ovens and equipment for pharmaceutical industry, Visomes will be presenting a water triple point cell developed together with INMETRO.

33. Zema Zselics, São Bernardo do Campo, SP

Largest manufacturer of grinding machines in Brazil, Zema Zelics will be presenting, together with the Advanced Manufacturing Nucleus, a new concept of high-speed machine that, with two wheel heads with independent programming, reduces grinding times to half and allows more flexible operation when compared to machines with only one wheel head.

Institutions

1. Centro de Tecnologia em Saneamento e Meio Ambiente – SENAI/CETSAM, Curitiba, PR

The National Technological Center for Sanitation and Environment belongs to the SENAI (National Service for Industrial Training) system and works with enterprises in the development of environmental management and technologies (clean production, effluents and water treatment, solid waste, atmospheric emissions, among others). *Partner enterprise: Kraft Foods Brasil S.A.*

2. Centro Integrado de Manufatura e Tecnologia – SENAI/CIMATEC, Salvador, BA

The Integrated Manufacturing and Technology Center also belongs to the SENAI system and conducts applied research for enterprises on industrial and fabrication processes, manufacturing systems, automation, materials, production and logistics management etc. *Partner enterprise: Endoview.*

3. Centro Nacional de Referência em Biomassa – CENBIO, São Paulo, SP

The National Reference Center on Biomass, located in the campus of the University of São Paulo, works on R&D of technological, economic, social, environmental and Institutional studies related to biomass conversion and use in different sectors and focuses on implementing energy generation from biomass through efficient processes. *Partner enterprises: Dedini and Eletronorte. Partner institution: UNICAMP – University of Campinas, Hydrogen Laboratory (fuel cell).*

4. Escola Superior de Agricultura Luiz de Queiroz ESALQ, Piracicaba, SP

The Luiz de Queiroz College of Agriculture is part of the University of São Paulo and is considered a center of excellency in agricultural sciences; research is conducted on agriculture, forestry, agro-industrial economics, food sciences, biological sciences and environmental management. *Partner enterprise: BUG Agentes Biológicos.*

5. Fundação de Amparo à Pesquisa do Estado de São Paulo – FAPESP, São Paulo, SP

The State of São Paulo Research Foundation is one of the largest agencies for the support of scientific research in Brazil. The development of innovative products and processes is supported by specifically targeted programs such as Partnership for Technological Innovation (PITE), Small Business Innovation Research (PIPE), Sector Consortia for Technological Research (ConSITec) and Support of Intellectual Property, that benefited the *partner enterprises: Area Química, Fiberwork, Sabó and Sima Consulting.*

6. Fundação Centros de Referência em Tecnologias Inovadoras – CERTI, Florianópolis, SC

The CERTI Foundation (Reference Centers for innovative Technology), located in the campus of the Federal University of Santa Catarina, focuses the development of systems of digital convergence with applications in various segments of technological innovation, specially those that center on the human being and on the improvement of quality of life. *Partner enterprise: SAPIENS S.A.*

7. Instituto A.L.Coimbra, Pós-Graduação e Pesquisa de Engenharia – COPPE/UF RJ, Rio de Janeiro, RJ

The Alberto Luiz Coimbra Institute for Engineering Research, under the Federal University of Rio de Janeiro, is the largest engineering teaching and research center in Latin America, well established as a technology and development pole. Main programs address biomedical, civil, electrical, mechanical, metallurgic and materials, nuclear, ocean, energy planning, chemical, transport engineering and system and computer sciences, while interdisciplinary programs focus on high performance computing and applications, composite materials, technology for exploitation of marine resources and petroleum systems, environment engineering and telecommunications. *Partner enterprise: Petrobras.*

8. Instituto Nacional de Metrologia, Normalização e Qualidade Industrial – INMETRO

The National Institute of Metrology, Standardization and Industrial Quality plays an important role towards competitiveness, improvement of quality of life, environmental protection and fair trade through scientific and industrial metrology, legal metrology, accreditation of laboratories and of certification and inspection bodies. *Partner enterprises: Mitutoyo and Visomes. Partner institutions: INT – National Institute of Technology and PUC-Rio – Catholic University of Rio de Janeiro.*

9. Instituto Nacional de Pesquisas da Amazônia – INPA, Manaus, AM

The National Research Institute of the Amazon conducts R&D related to the natural environment and the social, economic and cultural systems of the Amazon region, aiming at its development. Main fields of research include human and social sciences, agronomy, aquatic biology, molecular biology, ecology, entomology, botany, health, geo-sciences, natural products, forest products, aqua-culture, food technology and tropical silviculture.

10. Instituto Nacional de Pesquisas Espaciais – INPE, São José dos Campos, SP

The National Institute of Space Research conducts research on Space and atmospheric sciences, earth observation, meteorology and space engineering; it also provides numerical and climate forecasts routinely, applies remote sensing techniques to local problems and develops space systems, such as satellites and ground based systems. *Partner enterprises: Fibraforte and Gisplan.*

11. Instituto Nacional de Tecnologia – INT, Rio de Janeiro, RJ

The National Institute of Technology conducts technology research in the fields of chemistry, materials, energy, environment, production management and industrial design, with a focus on the generation and dissemination of new technologies of low cost and high added value. *Partner enterprises: Petrobras and Trilha.*

12. Instituto de Pesquisas Energéticas e Nucleares – IPEN, São Paulo, SP

The Nuclear and Energy Research Institute, located in the campus of the University of São Paulo, stands out by developing nuclear energy applications in the fields of radiation and isotopes use, nuclear reactors, materials and fuel cycle, radiation protection and dosimetry, focused on the needs of society, specially those related to health, biotechnology, radiochemistry and advanced materials. *Partner enterprises: Biolab and Electrocell. Partner institutions: CIETEC – Technology-based Business Incubator Center and Technology Park of São Paulo.*

13. Instituto de Pesquisas Tecnológicas do Estado de São Paulo – IPT, São Paulo, SP

The Technology Research Institute of São Paulo, located in the campus of the University of São Paulo, is well known for its expertise in a wide range of fields and for the development of innovative processes, products and software; IPT focuses on work for industry clusters, suggestions of regional innovation strategies, metrology, certified reference materials and regional and national programs such as those for quality of public housing, quality of public school furniture and textbooks, innovative solutions health problems, environmental issues, civil defense, fire safety and water resources management. *Partner enterprise: **Intermed.***

14. Instituto de Tecnologia para o Desenvolvimento – LACTEC, Curitiba, PR

The Institute of Technology for Development conducts R&D and provides quality control and other technological services, while promoting innovation and technology transfer in the fields of materials, applied chemistry, mechanics, electronics, electric power, vehicle emissions, environmental resources, hydraulics, hydrology, geological techniques, structures and concrete, information technology and software engineering.

15. Laboratório Nacional de Luz Síncrotron – LNLS, Campinas, SP

The National Synchrotron Light Laboratory makes its facilities available to users from Brazil and abroad for studies in the fields of physics, chemistry, materials sciences molecular biology and accelerator physics, among others; a wide variety of materials characterization techniques can be used to study the chemical, crystallographic and electronic structure of traditional and novel materials so that real problems in several industry sectors can be solved. *Partner enterprises: **EMBRAPA, D&L Welding, GETEC, HP and Rhodia.** Partner institutions: **Fermilab and Ludwig Institute of Cancer Research***

16. Núcleo de Manufatura Avançada – NUMA, São Carlos, SP

The Advanced Manufacturing Nucleus, which brings together several research groups from different universities (University of São Paulo in São Carlos, Federal University of São Carlos, University of Campinas, Methodist University of Piracicaba and Aachen University, Germany), targets practical projects that aim at increasing productivity of companies through integrated manufacturing research; results are combined by an “Integration Scenarios” tool that simulates manufacturing environments in a fictitious model factory. *Partner enterprises: **São Carlos High Technology Cluster and Zema Zselics.** Partner institutions: **IFM – Millenium Factory Institute.***

17. Serviço Brasileiro de Apoio à Micro e Pequena Empresa – SEBRAE Nacional, Brasília, DF

The Brazilian Micro and Small Business Support Service fosters the sustainable development of small enterprises through promoting capacity-building courses, facilitation of credit access, encouraging cooperation between companies, organizing fairs and business rounds and developing activities that contribute towards the creation of jobs and increased income; SEBRAE operates in the 26 states of Brazil through 600 service points. *Partner small enterprises: **Bambusa, Brapenta, Exatron, Flúidos da Amazônia and Polymar.***

18. Serviço Nacional de Aprendizagem Industrial – SENAI Nacional, Brasília, DF

The National Industrial Training Service is today one of the most important hubs in Brazil for the generation and dissemination of knowledge and know-how as applied to industrial development; it runs programs in 28 different areas, servicing many different economy sectors through training of human resources and rendering services that range from upgrading production processes through to providing laboratory facilities, all backed by applied research and technological information. *Partner enterprises: Endoview and Kraft Foods Brasil. Partner institutions: SENAI/CETSAM and SENAI/CIMATEC.*

19. Universidade Federal de Minas Gerais

An important federal university, UFMG presents one of the highest level of patented technologies due to its investment on real possibilities transferring knowledge and technology to the market. Its *partner institution, FUNDEP – Foundation for Research and Development*, plays an important role in bringing together university and enterprises and in managing projects and services in all fields of knowledge. *Partner enterprise: Ecovec.*

20. National Institute of Standards and Technology

Founded in 1901, NIST is a non-regulatory federal agency within the U.S. Commerce Department's Technology Administration. NIST's mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life. NIST carries out its mission in four cooperative programs:

NIST Laboratories, conducting research that advances the nation's technology infrastructure and is needed by U.S. industry to continually improve products and services;

Baldrige National Quality Program, which promotes performance excellence among U.S. manufacturers, service companies, educational institutions, and health care providers; conducts outreach programs and manages the annual Malcolm Baldrige National Quality Award which recognizes performance excellence and quality achievement;

Manufacturing Extension Partnership, a nationwide network of local centers offering technical and business assistance to smaller manufacturers; and

Advanced Technology Program, which accelerates the development of innovative technologies for broad national benefit by co-funding R&D partnerships with the private sector.

First poster entitled "The 5th International Symposium on Humidity and Moisture organized by INMETRO (Brazil) and NIST(USA)." The poster will contain organization and technical program topics of the Symposium and the planned bilateral comparison on humidity standards between INMETRO and NIST.

Second Poster is promoting international commerce, the underlying basis for the mutual recognition arrangements (MRA) is the equivalence of the primary or the derived SI units. This equivalence needs to be supported by the uncertainties stated in the calibration measurement capabilities (CMC) of the particular country, and the claims for the CMC are then supported by participation in international comparisons performed by the national measurement institutes (NMI). We describe the planned comparison of US and Brazil radiance temperature scales from 300 °C to 1500 °C using infrared-radiation thermometers and tungsten-strip lamps. The purpose of the comparison is to support the submitted CMC of Brazil. The work will be carried out in two phases with calibrated tungsten-strip lamps as transfer

artifacts in the temperature region from 800 °C to 1500 °C and a calibrated infrared-radiation thermometer from 300 °C to 800 °C. These transfer standards will be carried between NIST and INMETRO by NMI personnel with week-long measurements planned at INMETRO. This will be recorded with the appropriate working group of the Consultative Committee on Temperature and tentatively the work will be completed by the end of 2005.

21. American Chemical Society

The American Chemical Society (ACS) is a not-for-profit membership organization, founded in 1876 and chartered by a 1937 Act of the U.S. Congress. With a membership of over 159,000 chemists, chemical engineers, and other practitioners of the chemical sciences, it is the world's largest scientific society. ACS is recognized as a world leader in fostering scientific education and research, and promoting the public's understanding of science.

Over the last two decades, the ACS Office of International Activities has been active in the developing and sustaining programs of partnership and exchange in Brazil and, in particular, with the Brazilian Chemical Society (SBQ). This poster session will provide details of the history and envisioned future of ACS bilateral engagement in Brazil related to the chemical sciences, including co-organization of environmental chemistry, biotechnology, chemical education workshops, and frontiers of chemistry symposia; development of a chemically related activities in Brazil database; completion of an NSF-funded program to enhance US/Brazil research collaboration in the chemical sciences. A new area of development involves the ACS Voluntary Industry Standards Database which is aimed at improving the preparation of technicians working for chemistry related industry. The database is an interactive, customizable, web-based tool that allows local industry to partner with local technical schools to ensure that graduates are equipped with knowledge and skills to succeed in local industry.

22. Sigma Xi, The Scientific Research Society

Founded in 1886, Sigma Xi, The Scientific Research Society is the interdisciplinary honor society for scientific and engineering researchers. The mission of the Society is to enhance the health of the research enterprise, foster integrity in science, and promote the public's understanding of science for the purpose of improving the human condition. Not only do Sigma Xi members come from different fields of research, but they also live in approximately 100 different countries. Through the recent Packard International Science Networking Initiative, several online tools were developed, and the Society's network was extended even further. This poster will describe Sigma Xi's opportunities and resources for individuals and groups in the international research community.