



Research Institutions Industry Cooperation to Promote Innovation and Commercialization of Research Results: The Role of IP

The PUC-Rio Experience

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Dar es Salaam
United Republic of Tanzania
12 March, 2013

Outline

- **PUC-Rio - Relevant Data**
- **Cooperation with Enterprises**
- **IP&TT at PUC-Rio**
- **Innovation Trends**
- **AGI/PUC-Rio: Mission and Results**
- **Technology Transfer at PUC-Rio:**
 - ✓ **Licensing**
 - ✓ **Incubation of New Enterprises**

PUC-RIO

PONTIFICAL CATHOLIC UNIVERSITY OF RIO DE JANEIRO

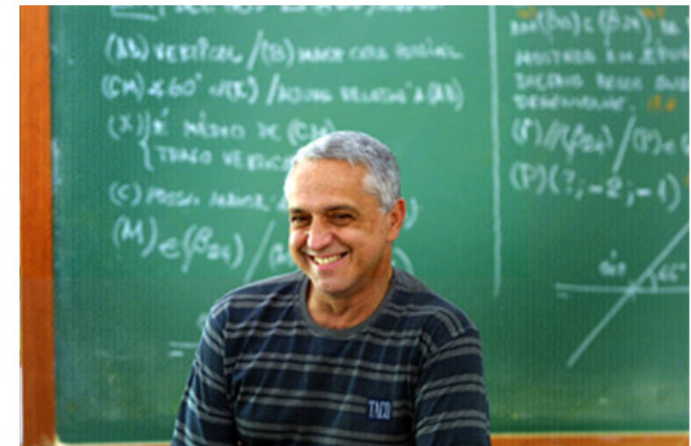


PONTIFÍCIA
UNIVERSIDADE
CATÓLICA
DO RIO DE JANEIRO





WELCOME TO PUC-RIO





PUC-Rio HISTORY AND MISSION



- **First Private Higher Education Institution in Brazil**, created by the Catholic Church.
- **Founded in 1940** by Cardinal Sebastião Leme and Father Leonel Franca S.J.

1946 - Acquired the **status of University**.

1947 - The title of **Pontifical** was conferred.

1948 - Creation of the **Polytechnic School**

1955 - Moves to the **present campus**.

1957 - **Scientific Research started/Physics**.

1960 - **First Main Frame Computer** installed for **Academic Purpose** in a Brazilian University.

1963 - Creation of the first **Graduate Course** (Master Degree only).

1965 - First **Master of Science Degree** conferred.

1968 - Introduction of the **Credit System**;
- Beginning of **Doctorate Courses**, the University adopts the current structure.



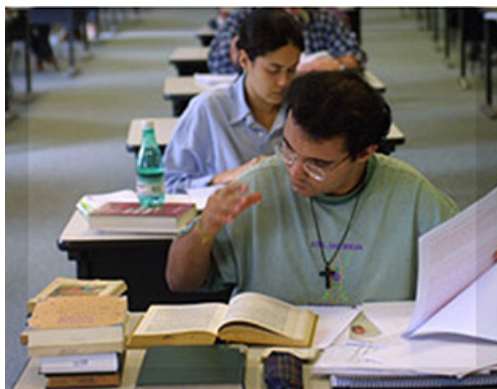
PUC-Rio HISTORY AND MISSION



- 1972** - **First Computer Science Centre in a Brazilian University**/*Rio Data Centro (RDC)*.
- 1975** - **Doctorate in Engineering** started.
- 1980** - “Solar Grandjean de Montigny”, **PUC-Rio Cultural Centre**, now protected as a **Brazilian Heritage Office**.
- 1991**- Creation of the **International Programs Office**, now, Central Coordination (**CCCI**).
- 1997**- **Genesis Institute** for **Academic and Entrepreneurial Development**.
- 1999** - **NIMA** -Interdisciplinary **Centre for the Environment**, created by the current Rector.
- 2003** - **Interdisciplinary Centre for African Descendant Research and Heritage**-**NIREMA**.
-Project ENPI **IP&TT Office** supported by CNPq.
- 2009** - **Institute of Digital Medias**, the **first Digital Media Institute** created in Brazil.
- 2010** - **AGI/PUC-Rio - IP&TT Institutionalization**.
- 2011**- **Confucius Institute** - Dissemination of the **Chinese Culture and Language**.



PUC-RIO IN NUMBERS 2012



Total number of Students

Undergraduate*	12.765
Graduate	2.306
Continuing Education	3.572

**Including Exchange and Special students*

- **Undergraduate Students under the full or partial fee waiver regime..... 5.142**
- **Graduate Students with Scholarships 2.000**

Total number of Faculty members

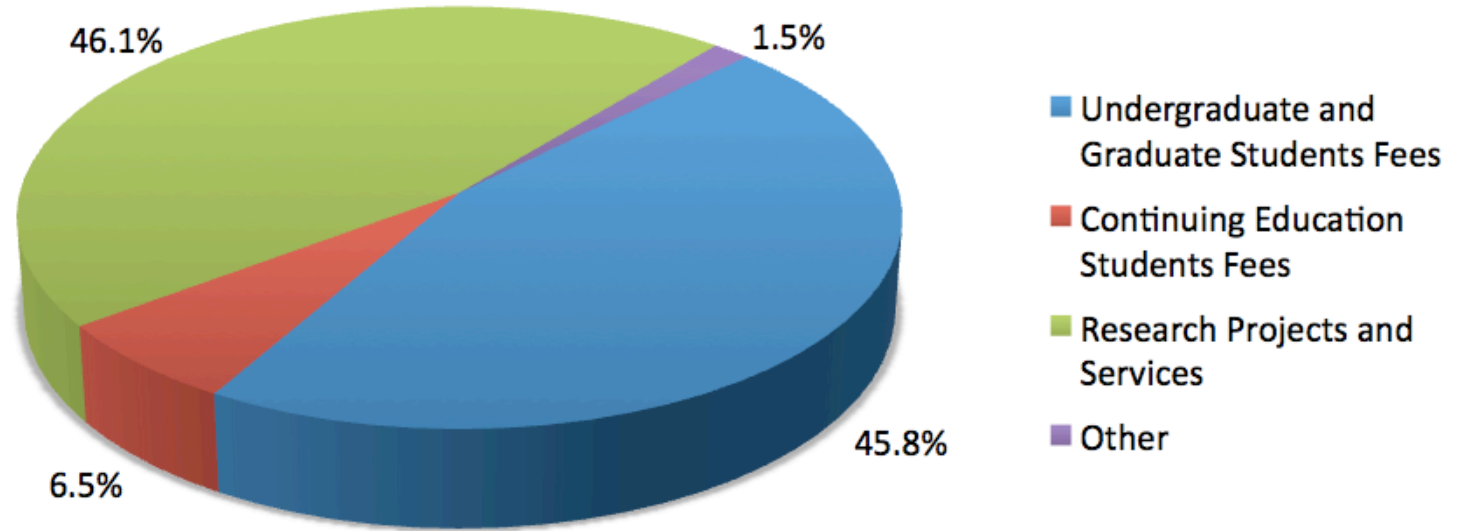
Full time	428
Part time	865
▶ With Master degree	302
▶ With PhD degree	774
Continuing education	650



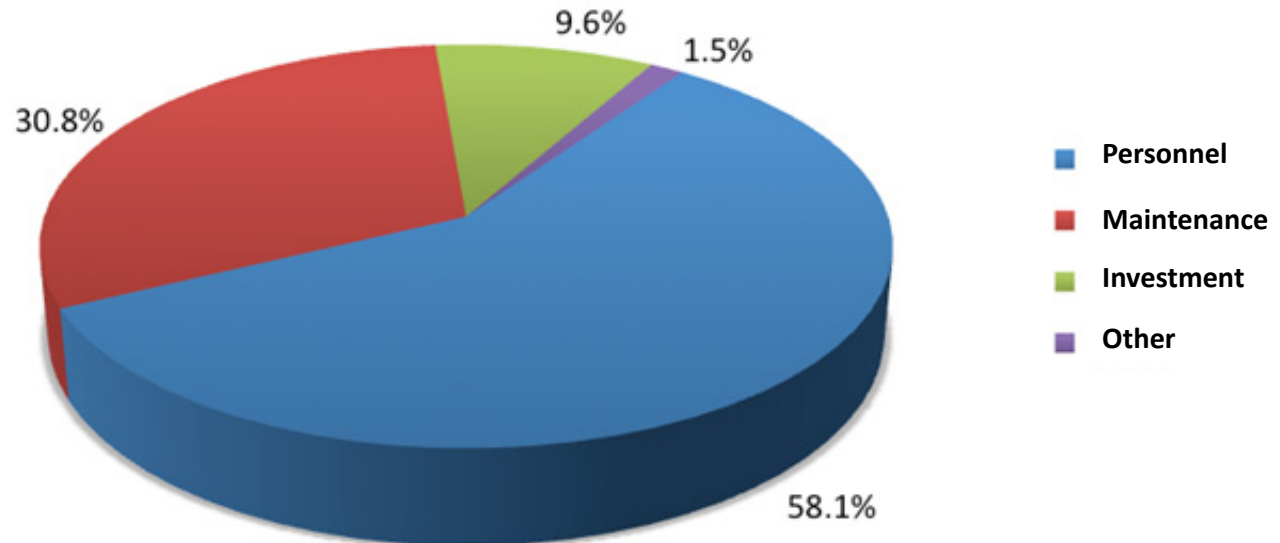
PUC-RIO IN NUMBERS



Income



Expenses





PUC-Rio RANKINGS

STUDENT GUIDE AND QUACQUARELLI SYMONDS

Abril Publisher Student Guide Evaluation | 2012
Assesses undergraduate courses (annually) | Grades range
from 1 to 5 stars

5 STARS COURSES	2012	5 STARS COURSES	2012
Business	★★★★★	International Relations	★★★★★
Civil Engineering	★★★★★	Journalism	★★★★★
Computing Engineering	★★★★★	Mathematics	★★★★★
Design	★★★★★	Pedagogy	★★★★★
Economics	★★★★★	Production Engineering	★★★★★
Geography	★★★★★	Social Service	★★★★★
Information System	★★★★★	Translation and Interpreting	★★★★★

Quacquarelli Symonds University Ranking | Latin America 2012
PUC-Rio is in the 18th position in the ranking, among the 200 evaluated universities.
8th in Brazil
2nd position in the State of Rio de Janeiro
1st private Institution of Higher Education in Brazil



THE Campus





PUC-Rio THE GÁVEA *CAMPUS*

LOCATED AROUND THE FOREST AND THE BEACH, THE CAMPUS OCCUPIES A PLEASANT GREEN, CROSSED BY A STREAM, WHERE THE DIVERSITY OF FLORA AND FAUNA CAN BE OBSERVED.



Copyright NIMA / PUC-Rio

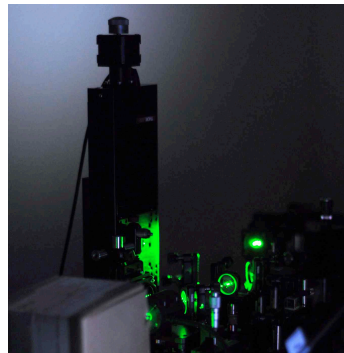
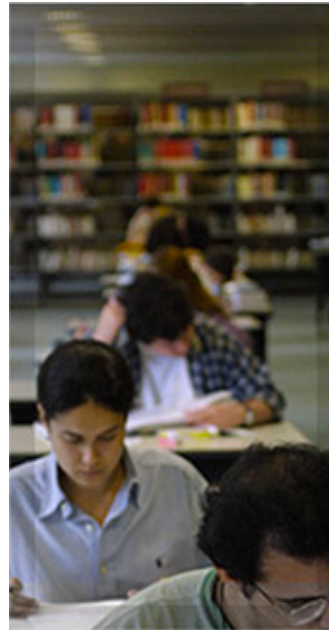
PUC-Rio





PUC-Rio THE GÁVEA CAMPUS

3 MAIN BUILDINGS:
FRINGS
KENNEDY
CARDEAL LEME
24 DEPARTMENTS
15 ADDITIONAL UNITS
1 CENTRAL LIBRARY
6 SECTORIAL LIBRARIES
3 AUDITORIUMS
WI-FI INTERNET SPACES





PUC-Rio

ACADEMIC CENTRES AND

DEPARTMENTS

UNDERGRADUATE COURSES
CENTRAL COORDINATION OFFICE
ASSOCIATE VICE-PRESIDENT FOR
ACADEMIC AFFAIRS
PROF. DANIELA VARGAS

GRADUATE COURSES CENTRAL
COORDINATION OFFICE
ASSOCIATE VICE-PRESIDENT
FOR
ACADEMIC AFFAIRS
PROF. PAULO CESAR DUQUE
ESTRADA

THEOLOGY AND
HUMAN SCIENCES
CENTRE (CTCH)



Arts and Design, Education,
Letters, Philosophy,
Psychology, and Theology.
Institute for Advanced Studies
in Humanities (IEAHu)

SCIENCE AND
TECHNOLOGY
CENTRE (CTC)



Physics, Chemistry, Mathematics,
Informatics and the Departments of
Civil, Industrial, Electrical, Materials
and Mechanical Engineering. Center
of Telecommunication Studies
(CETUC), Institute of Energy (IEPUC)
and Institute of Technology (ITUC)

SOCIAL SCIENCES
CENTRE (CCS)



Business & Administration, Economics,
Geography, History, International
Relations, Law, Social Sciences, Social
Service and Social Communication.
Interdisciplinary Institute for the
Environment, Interdisciplinary Institute for
the African Descendant Memory

BIOLOGY AND
MEDICAL SCIENCES
CENTRE (CCBM)



Biological Sciences
(undergraduate level) Medicine
and Dentistry (specialization
courses – Graduate certificate
programs – held off-campus)

THEOLOGY AND HUMAN SCIENCES CENTRE (CTCH)

DEAN

Prof. Paulo Fernando de Andrade,
(paulof@puc-rio.br)

DEPARTMENTS:

ARTS & DESIGN, EDUCATION, LETTERS,
PHILOSOPHY, PSYCHOLOGY AND
THEOLOGY

ADDITIONAL UNIT:
INSTITUTE FOR ADVANCED
STUDIES IN HUMANITIES

Undergraduate Courses - Bachelor

Education
Industrial Design
Pedagogy
Performing Arts
Philosophy
Portuguese & Literature or Portuguese, English & Literature
Psychology
School Administration and Supervision, Educational Orientation or
Teacher's Training
Theology
Translation – Translation, Conference Interpretation
Visual Communication Fashion, Digital Media or Product
Development
Writing
Some courses grant Teacher Licensure Degree

Graduate Programs

Brazilian Education – M/D	Literature Studies – M/D
Clinical Psychology – M/D	Philosophy – M/D
Design – M/D	Theology – M/D
Language Studies – M/D	M: Master – D: Doctorate

SOCIAL SCIENCES CENTRE (CCS)

DEAN

Prof. Luis Roberto de Azevedo Cunha
(lirac@puc-rio.br)

DEPARTMENTS:

BUSINESS AND ADMINISTRATION,
ECONOMICS, GEOGRAPHY, HISTORY,
INTERNATIONAL RELATIONS, LAW,
SOCIAL COMMUNICATION, SOCIAL
SCIENCES, SOCIAL SERVICES

ADDITIONAL UNITS:

INTERDISCIPLINARY CENTER FOR THE
ENVIRONMENT, INTERDISCIPLINARY
CENTER FOR THE AFRICAN DESCENDANT
MEMORY

Undergraduate Courses – Bachelor

Business Administration	Journalism
Cinema	Law
Economics	Publicity and Advertising
Geography	Social Sciences
History	Social Service
International Relations	

Some courses grant Teacher's Licensure Degree

Graduate Programs

Business Administration – M/D	Law – M/D
Business Administration – M*	Social Communication – M
Economics – M/D	Social Cultural History – M/D
Geography – M	Social Sciences – M/D
History - M/D	Social Service – M/D
International Relations – M/D	Sociology and Politics – M/D

M: Master – D: Doctorate

**Lato Sensu*

SCIENCE AND TECHNOLOGY CENTRE (CTC)

DEAN

Prof. Luiz da Silva Mello
(smello@cetuc.puc-rio.br)

DEPARTMENTS:

PHYSICS, CHEMISTRY, MATHEMATICS,
INFORMATICS, CIVIL ENGINEERING,
ELECTRICAL ENGINEERING, INDUSTRIAL
ENGINEERING, MECHANICAL
ENGINEERING, MATERIALS ENGINEERING

ADDITIONAL UNITS:

CENTER FOR TELECOMMUNICATION
STUDIES, TECHNOLOGY INSTITUTE,
ENERGY INSTITUTE

Undergraduate Courses – Bachelor

Automation & Control Engineering	Information Systems
Chemical Engineering	Mathematics
Chemistry	Mechanical Engineering
Civil Engineering	Nanotechnology Engineering
Computer Science	Petroleum Engineering
Computing Engineering	Physics
Electrical Engineering	Production Engineering
Environmental Engineering	

Interdisciplinary course: Architecture and Urbanism

Graduate Programs

Chemistry – M/D	Mathematics – M/D
Civil Engineering – M/D	Metrology – M
Computer Science – M/D	Physics – M/D
Electrical Engineering – M/D	Production Engineering – M/D
Mechanical Engineering – M/D	Production Engineering – M*
Materials Engineering and Chemical and Metallurgical Processes – M/D	
Urban and Environmental Engineering – M*	

M: Master – D: Doctorate
*Lato Sensu

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ENGINEERING, MATERIALS ENGINEERING

ADDITIONAL UNITS:

CENTER FOR TELECOMMUNICATION
STUDIES, TECHNOLOGY INSTITUTE,
ENERGY INSTITUTE

Main Research Areas and Special Projects

Civil Engineering

Applied Computer Graphics
Biomechanics
Boundary Elements Methods
Computational Geomechanics
Environmental Geotechnics
Experimental Geotechnics
Inelastic Structures and Materials
Instability and Dynamics of Structures
Metal Structures
Non-Conventional Materials
Petroleum Geomechanics
Reinforced and Pressed Concrete Structures
Rock Mechanics and Engineering Geology
Structures and non-elastic Materials

Computer Science

Computer Graphics
Databases
Distributed Systems and Computer Networks
Human-Computer Interaction
Multimedia and Hypertext
Optimization and Automatic Reasoning
Programming Languages
Software Engineering
Theory of Computation

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ENGINEERING, MECHANICAL
ENGINEERING, MATERIALS ENGINEERING

ADDITIONAL UNITS:

CENTER FOR TELECOMMUNICATION
STUDIES, TECHNOLOGY INSTITUTE,
ENERGY INSTITUTE

Main Research Areas and Special Projects

Electrical Engineering

Antennas
Cellular Mobile Communication Systems
Communication Network
Computational Intelligence
Computational Nanotechnology
Digital Transmission Systems
Economic and Financial Management
Image Analysis
Linear and Nonlinear Models
Microwaves and Optical Communication Systems
Mobile Robotics
Nanodevices and Nanomaterials
Nanoelectronics
Optimization
Optoelectronics and Instrumentation
Planning and Operation
Quantum and Reversible Computing
Radio Wave Propagation
Satellite Communication Systems

Institute of Technology of PUC-Rio (ITUC)

Calibration Services
Materials Engineering and Product Analysis
Mechanical Properties and Behavior of
Materials
Solar energy
Vehicular Engineering

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ENGINEERING, MECHANICAL
ENGINEERING, MATERIALS ENGINEERING

ADDITIONAL UNITS:

CENTER FOR TELECOMMUNICATION
STUDIES, TECHNOLOGY INSTITUTE,
ENERGY INSTITUTE

Main Research Areas and Special Projects

Materials Engineering and Chemical and Metallurgical Processes

Environmental Technologies
Extraction, Synthesis and Chemical Processing of Materials
Material Performance and Integrity
Materials Joining
Materials processing and Characterization
Mineral Processing
Nanostructured materials / Characterization
Nanostructured materials / Synthesis
Phase Transformation
Steel Making

Mechanical Engineering

Energy
Fluids Engineering
Heat and Mass Transfer
Heat Engines
Mechanical Systems
Petroleum Engineering
Pipeline Engineering
Robotics and Mechatronics
Structural Integrity

Production Engineering

Capital Markets
Corporate Finance
Logistics Systems
Operations Management
Planning and Organization of
Production Systems
Quality Engineering
Transportation Systems

Metrology for Quality and Innovation

Instrumentation and measurement
Intelligent networks (smart Grid)
Strategic Management of Innovation and Sustainability

Urban and Environmental Engineering

Environmental Technologies
Infrastructure and Sustainability
Urban Planning and Sustainability

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DEPARTMENTS:

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ELECTRICAL ENGINEERING, INDUSTRIAL
ENGINEERING, MECHANICAL
ENGINEERING, MATERIALS ENGINEERING

ADDITIONAL UNITS:

CENTER FOR TELECOMMUNICATION
STUDIES, TECHNOLOGY INSTITUTE,
ENERGY INSTITUTE

Main Research Areas and Special Projects

Chemistry

Development of Analytical Methods
Drugs and Chemo-Biological
Interactions
Energy, Environment and
Marine Sciences
Nanosciences

Mathematics

Algebraic Geometry
Analysis and Differential Equations
Combinatorics
Computer Graphics
Differential Geometry
Dynamical Systems
Mathematical Physics
Probability and Stochastic Processes
Scientific Computing
Topology

Physics

Applied Superconductivity and magnetism
Atomic and Material's Physics
Atomic Collisions
Cosmic Radiation at Extreme Energies
Electromagnetic Nondestructive Evaluation of Materials
Electronic and transport properties of materials
Fabrication and Characterization of Nanostructures
Granular systems
High Energy Physics
Molecular Biophysics / spectroscopy
Nanostructured Materials
Neutrino Physics and Astrophysics
Organic optoelectronic devices
Photonic components in fibers and glass
Statistical Physics
Surface Physics



Partnership with Enterprises Strategy to face Challenges

1983: Padre Leonel Franca Foundation created.

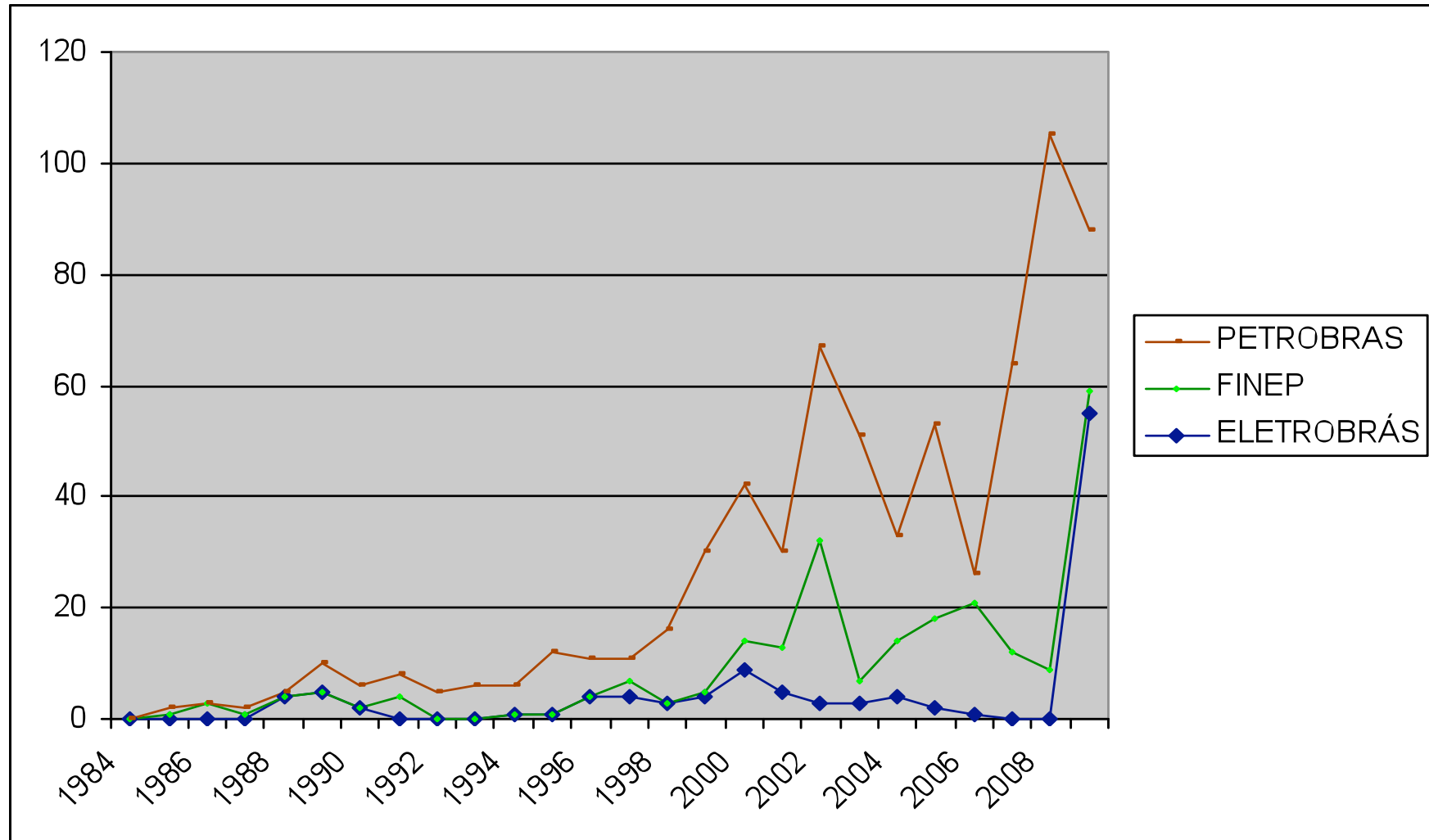
1993: Institutionalization of the Partnerships with Enterprises in order to support the CTC - Scientific & Technological Centre Research.

1994: Created the CTC Development Office (ED) to enhance cooperation with Enterprises and to support Faculty members in negotiations and management of the R&D Contracts.

1996/7: Entrepreneurship Genesis Institute creation for Academic Activities and Innovative Enterprises Incubation.



Evolution of the Partnership with Enterprises





PUC-Rio PARTNERSHIPS

THE GREAT NUMBER OF PARTNERSHIPS AND AGREEMENTS IN WHICH PUC-RIO PARTICIPATES EVINCES NOT ONLY THE EXTENT OF THE UNIVERSITY INTEGRATION INTO THE BRAZILIAN SOCIETY, BUT ALSO THE DEGREE OF TRUST THAT IT SHARES WITH OTHER INSTITUTIONS AS A SERIOUS MODEL OF EDUCATION. THESE PARTNERSHIPS CREATE COUNTLESS ADVANTAGES FOR STUDENTS AND PROFESSORS.

Some PUC-Rio's partners

➤ **PETROBRAS**

Research & Work comprising **the whole production chain of oil & gas.**

➤ **ELETROBRAS**

Research & Analyses on production & consumption of electrical power.

➤ **EMBRAER** Research on Aviation Industry.

➤ **EMBRATEL, SIEMENS** and other **telecommunications companies.**

➤ “Rede Globo”, VALE, Thyssenkrupp, Gerdau, “Peugeot-Citroen do Brasil”.

➤ **The community benefits directly from the results of such work, which provides students with an education that is sound and compatible with the world's changes and Innovation Trends.**



IP&TT at PUC – Rio

- **1999: Policy of IP&TT issued (President's "Portaria 30/99").**
- **2001: Participation in a Research (FINEP/INPI) about IP&TT, and University / Enterprise Partnership in Brazil.**
- **2002: Project ENPI - FVA/TIB-01/2002.**
- **October/2002: 1st. Speech about IP&TT at CSD/CTC/PUC-Rio.**
- **September/2003: CNPq/PUC-Rio Agreement signed to support ENPI's (TTO) Project start up.**
- **December/2003 : 1st. ENPI's Workshop "Intellectual Property Management in network collaborative research University-Enterprise".**
- **October/2005: End of the ENPI's Project supported by the CNPq/PUC-Rio Agreement.**



Consolidation of IP&TT at PUC-Rio

- **March/2006: 1st. Cooperation Agreement with INPI**
- **December/2006: Project “Consolidation of ENPI’s activities” presented to FINEP for finance support.**
- **May/2007: FINEP/PUC-Rio Agreement signed for the Project “Consolidation of ENPI’s activities”**
- **December/2009: End of the FINEP Project for the “Consolidation of ENPI activities”.**
- **January/2010: Creation of the PUC-Rio Innovation Agency (AGI/PUC-Rio)**

www.agi.puc-rio.br



Innovation Trend at PUC-Rio

➤ PUC-Rio INNOVATION AGENCY

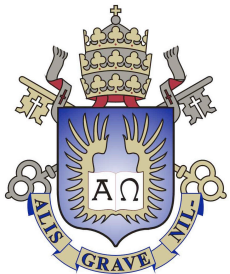
- ✓ **Spread of the knowledge and best practices** of the Innovation, Technology Transfer and Intellectual Property culture, aiming at add value to the knowledge generated at PUC-Rio.
- ✓ **Management, support and assessment of the IP&T**, trying to help the academic community in getting the best results, acknowledgment, and minimizing conflicts of interest.

➤ GENESIS INSTITUTE

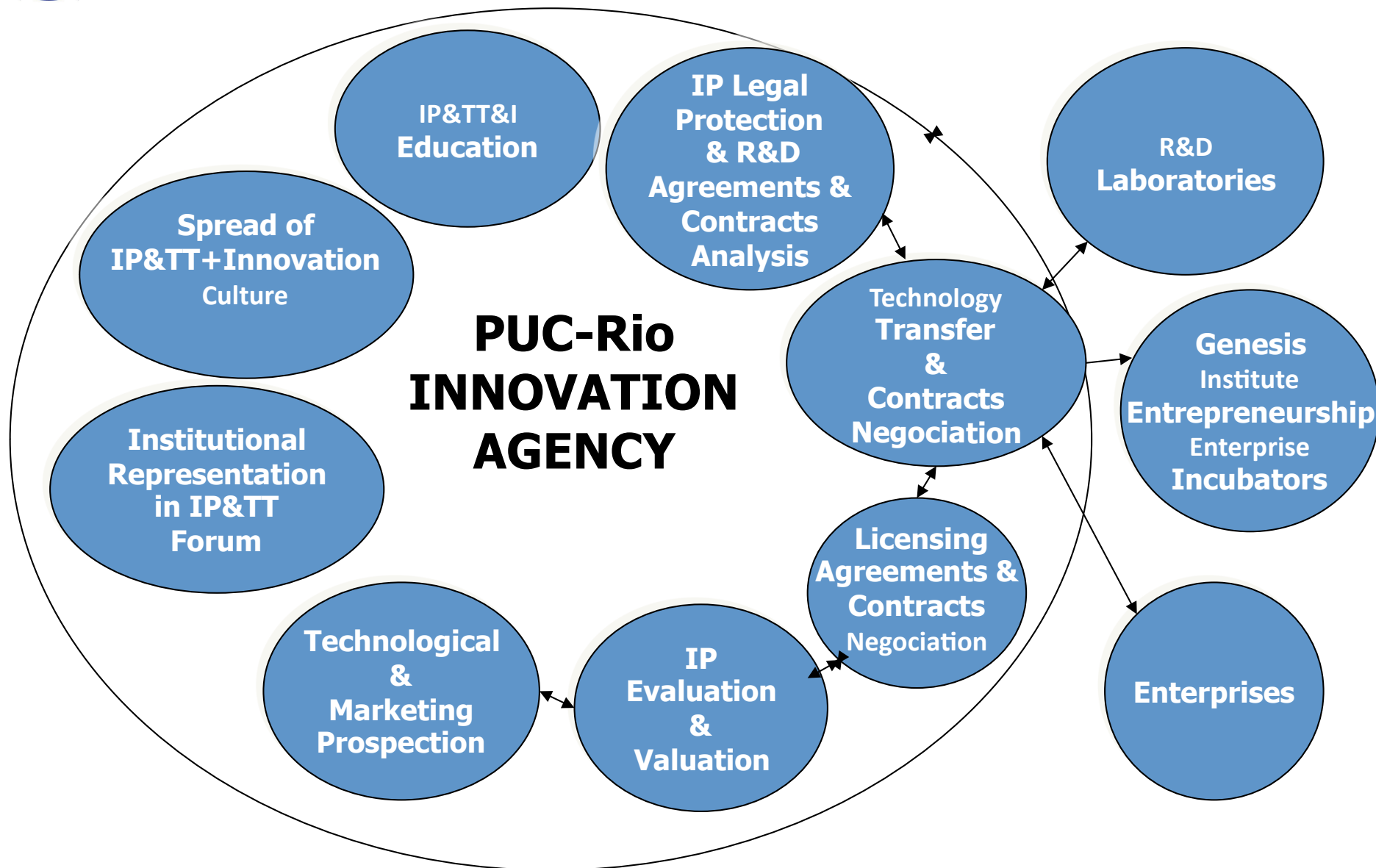
- ✓ **Knowledge transfer from the University to the Society** through the creation of new innovative enterprises, and **entrepreneurship education**, in order to improve on the standards of the life quality at the local and regional levels.

➤ DEVELOPMENT OFFICE - ED/CTC

- ✓ **Management of Agreements and Partnership Contracts** with Institutions and Enterprises.



Mission



IP&TT RESULTS: 2003 – 2012

➤ IP&TT Educational Activities

18 Courses and 22 Seminars / workshops with 2 310 participants
02 Master's Degree final course work

➤ IP Protection and Technology Transfer

78 Patents filled/issued

55 in Brazil and

23 through *PCT - Patent Cooperation Treaty, USPTO and others*

12 under negotiation for licensing

60 Trade Marks in Brazil

37 Trade Marks in the USA and Europe Union

60 Trade Marks in Latin America

36 Software Registered - 03 license contracts signed

06 Industrial Design in Brazil

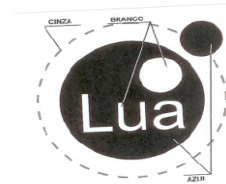
Commercialization of IP Assets at PUC-Rio

- Software Protection & Licensing: *Ginga Example*
- Use of Trade Mark: Protection & Commercialization

Free open source software



PUC
Argente



Ginga

Ginga
NCL

NCL
NESTED CONTEXT LANGUAGE

- Technology Protection & Licensing Challenges:
 - ✓ Lack of Proof of Concept Funds
 - ✓ Lack of Prototype and feasibility studies: High Risk
 - ✓ Lack of Information for evaluation & valuation
- Technology Transfer: New enterprises/spin-off

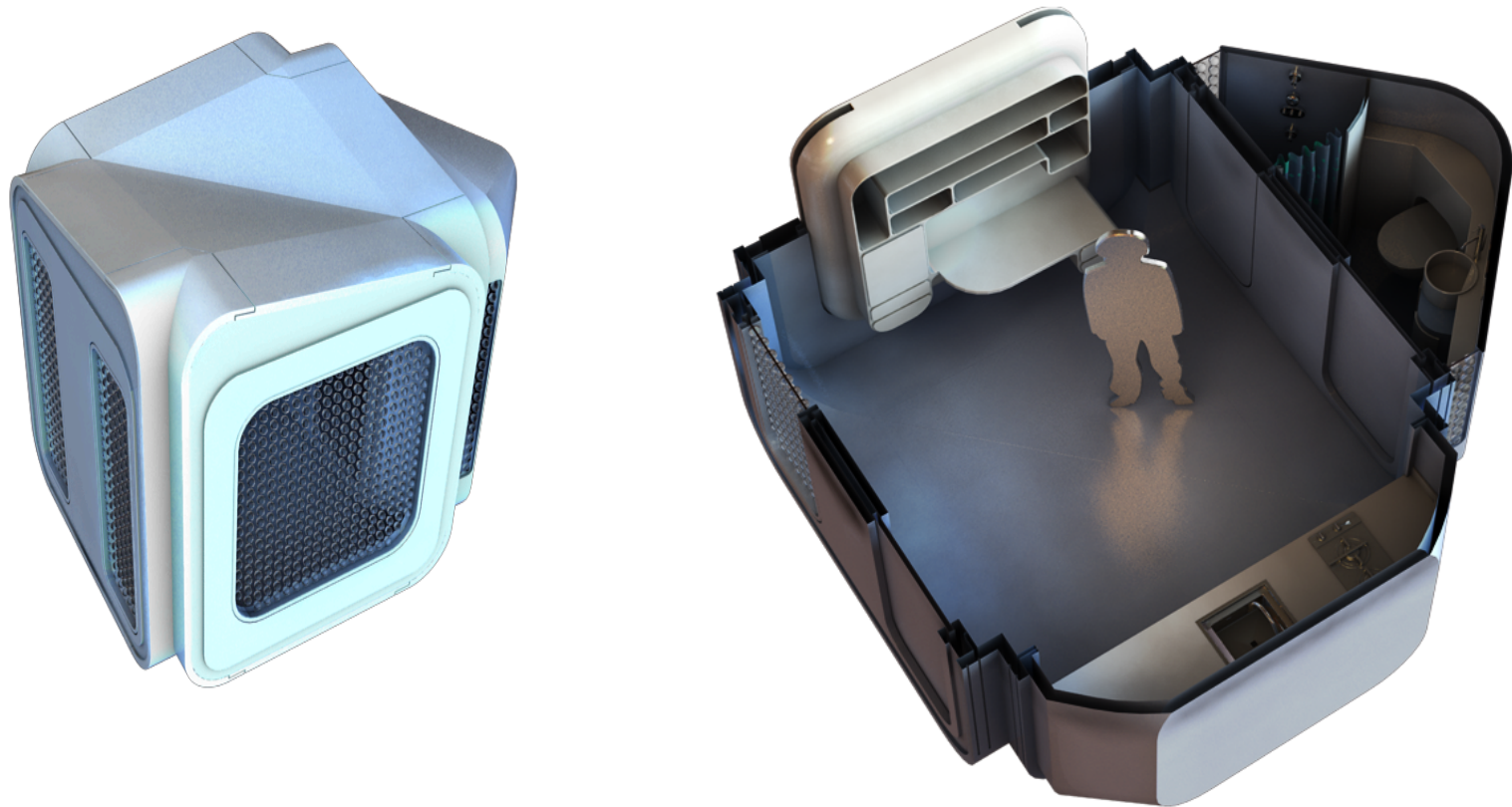
Assistive Technologies

Innovation for a Better Life



From Lab to the Market Place

A Long Journey



Commercialization of IP Assets

➤ **Participation in Innovation Events such as:**

- ✓ Rio Oil & Gas;
- ✓ AUTM Annual Meeting and Exhibition;
- ✓ International Seminar and Exhibition of Technology and Innovation for Disabilities Catalogue;
- ✓ Green Technology Catalogue & WIPO GREEN Platform.

➤ **Use of Researchers Networks such as:**

- ✓ Congresses, Conferences, Visits.

➤ **FORTEC's Initiatives:**

- ✓ WIPO GREEN Platform/ Catalogue of Green Technologies;
- ✓ Catalogue of Technologies for Disabilities.



Technological Incubation

Start-up: October 1996

- ✓ Industrial Automation
- ✓ Knowledge Management
- ✓ Energy, Oil and Gas
- ✓ Logistics and Geological Services
- ✓ Environment
- ✓ Special Services
- ✓ Telecommunications
- ✓ TIC



Cultural Incubation

Start-up: March 2002

1st. Cultural Incubator in Latin America

- ✓ **Audiovisual**
- ✓ **Design**
- ✓ **Entertainment**
- ✓ **Education**
- ✓ **Editorial**
- ✓ **Jewellery and Accessories**
- ✓ **Fashion Business**
- ✓ **Tourism**



Economic Impact

Graduated Enterprises Incubated in the Genesis Institute of PUC-Rio generated a revenue of R\$ 420 Million in 2012, that is more than the double of the value generated in 2011.

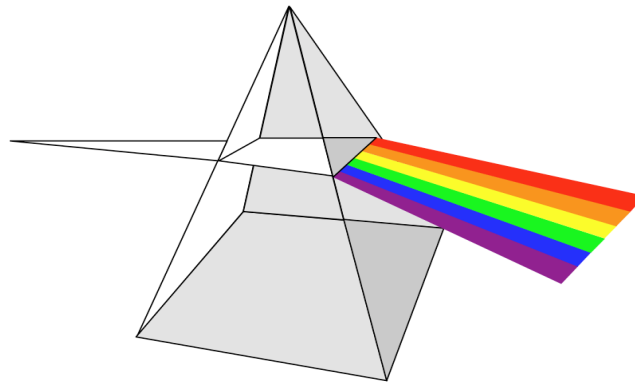
Enterprise Incubation Process

Selection

**High
Quality
at the
Entrance**



**Pre-
Incubation**



Graduation

Pos-Incubation



**Entrepreneurs
of High Quality**



Graduated Enterprises in the Technological Sector





Graduated Enterprises in the Cultural Sector





Social Incubation





Thank you!



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