

# The scientific research potential of the Iasi University centre in the perspective of the FP7 future collaborative projects

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# **IASI**

## **centre of cultural and scientific enlightenment**

## 5 universities

1. **Alexandru Ioan Cuza University** (15 faculties: natural, social and economic sciences, informatics, physics, chemistry, mathematics etc.)
2. **Gheorghe Asachi Technical University** (11 faculties: textiles, chemistry engineering, civil engineering, electrical engineering, automation and computers, architecture etc)
3. **Ion Ionescu de la Brad University of Agricultural Sciences and Veterinary Medicine** (4 faculties: agriculture, veterinary medicine, zootechny, horticulture )
4. **Grigore T. Popa University of Medicine and Pharmacy** (4 faculties: general medicine, dentistry, bio- engineering, pharmacy)
5. **George Enescu University of Arts** (4 faculties: music, composition, drama and fine arts)

- **Iasi Branch of the Romanian Academy**

1. Institute for Computer Sciences
2. Petru Poni Institute of Macromolecular Chemistry
3. Institute of Archeology
4. A.D. Xenopol Institute of History
5. Gh.Zane Institute of Social and Economic Research
6. Octav Mayer Institute of Mathematics

- **National Institute for Research and Development for Technical Physics**

# Alexandru Ioan Cuza University

- [www.uaic.ro](http://www.uaic.ro)
- Founded in 1860 by the prince Alexandru Ioan Cuza
- The first higher education establishment in the two united (1859) countries: Moldavia and Walachia
- Ranked on the first position (since 2004) on the national scoreboard (following the Shanghai classification) among other 49 universities at national level (<http://www.ad-astra.ro>)

# Alexandru Ioan Cuza University

## ■ **Excellence Research Centres**

1. Centre of Mathematical Analysis and Applications
2. Centre of Applied Psychology Research
3. University Centre for Human Geography and Urban Planning
4. Center for Applied Research in Physics and Advanced Technologies (CARPATH)

■ **Other 20 Research centres** covering all fields of knowledge: languages, informatics, economy, psychology , history etc.

*Periodical assessment at national level by the  
National Council for Research in Higher Education*

# Alexandru Ioan Cuza University

## main research topics

### Faculty of Physics

- Plasma physics
- Magnetism
- Semiconductors
- Dielectric materials
- Optics and spectroscopy
- Self-organised systems
- Theoretical physics
- Biophysics
- Medical Physics



# Alexandru Ioan Cuza University

## main research topics

### Faculty of Chemistry

- Synthesis, characterization and the study of reactivity of inorganic compounds with remarkable properties.
- Radiochemistry. Nuclear fuels and reprocessing of the spent nuclear fuels
- Chemistry of Heterocycles. Cicloimmonium Ylide Chemistry. Microwave and Ultrasounds Assisted Reactions.
- Phenothiazine chemistry.
- Paracyclophane chemistry.
- Quantum Dynamics, Nonlinear Dynamics and Spectroscopy
- Environmental Analytical Chemistry
- Nano- and biomaterials



# Alexandru Ioan Cuza University

## main research topics

### Faculty of Computer Science

- Codes and Cryptography
- Combinatorial Optimization
- Computational Biology Distributed Computing
- Modeling and Verification
- Distributed and Object-Oriented Databases
- Human Computer Interaction
- Logic in Computer Science
- Natural Language Processing and Human Language Technology
- Soft Computing (Genetic Algorithms, Evolutionary Techniques)
- Parallel Computing
- Formal Methods in Software Engineering
- Machine Learning
- Web Technologies (Semantic Web, Service Oriented Architecture)

# Alexandru Ioan Cuza University

## main research topics

### Faculty of Biology

- **Biochemistry and Molecular and Biology:** Enzymology ; Biotechnology ; Ecological biochemistry ; Microbial ecology ; Cytogenetics; Population genetics ; Cellular biology and Biophysics ; Ecophysiology
- **Vegetal Biology :** Ecological anatomy and experimental morphogenesis ; Vegetal physiology and ecophysiology ; Mycology; Phytopathology ; Vegetal taxonomy ; Preservation and long term use of the biodiversity
- **Animal Biology :** Zoology; Ecology and Preservation of biodiversity ; Entomology ; Ornithology ; Limnology ; Marine Biology ; Comparative Anatomy Ecomorphology ; Histology ; Animal Morphogenesis ; Bio-archaeology

# Alexandru Ioan Cuza University

## international programmes

10 projects developed under FP6 and FP7 (Marie Curie Actions, Specific Support Action) and

- **Euratom** : Sheath properties and related phenomena of the plasma wall interaction in magnetised plasma.
- **Network of Excellence**: Molecular approach to nanomagnets and multifunctional materials
- **STREP Specific Targeted Research Project: Lt4eI** - Language technology for e-learning
- **CRAFT SMes-Cooperative Research Project**: IP core and system design of associative memory arrays for semantic search

# Alexandru Ioan Cuza University international programmes

## 4 NATO projects

- Synthesis of highly fluorescent materials through eco-friendly methods
- Trace element pollution monitoring of the river Prut, Romania-Moldova
- Chemical composition of atmospheric aerosols in the North-Eastern Romania
- Pesticides and organic nitrate level in natural matrixes from Iasi-Romania

# Petru Poni Institute of Macromolecular Chemistry

- <http://www.icmppp.ro>
- founded in 1949 as an institute of the Romanian Academy.
- *Institute of Excellence of the Romanian Academy*
- ranked on the first/second position among the other 64 institutes/centres of the Romanian Academy

# Petru Poni Institute of Macromolecular Chemistry

## main research topics

- Chemistry of natural polymers and of their accompanying substances
- Green chemistry of polymers
- Specific nanomers and polymers- precursor for nanomaterials
- Heterocyclic and heterochain polymers for micro and nanomaterials
- Ionic polymers
- Electroactive polymers for electronic and opto-electronic applications
- Polymer network and macromolecular systems with designed properties
- Interpenetrated network based on biodegradable polymers
- Silicon-based intermediates and polymers
- Synthesis and characterization of new intelligent micro and nanostructured polyurethane materials
- Physical chemistry of polymers
- Physical and chemical properties and processes in polymers with tailored structure



# Petru Poni Institute of Macromolecular Chemistry

## international programmes

### ■ CRAFT

- A novel methodology for the safe handling and consolidation of dimensional stone blocks using a cost effective combination of vacuum-based technology and highly penetrating resin formulations (Block Save)

### ■ Network of Excellence

- Bringing nanotechnologies to life (Nano2Life)
- Innovative production machines and systems (I\*PROMS)
- European polysaccharides network (POLYSACCHARIDES)

### ■ Integrated project

- Re-engineering of natural stone chain through knowledge based processes, eco-innovation and new organisational paradigms (I STONE)



# Petru Poni Institute of Macromolecular Chemistry

## international programmes

### ■ Centre of excellence

- Biodegradable polymeric materials for health and environment (BIOMAHE)

### ■ Specific Support Actions

- Romanian Action for Integrating, Networking and Strengthening the European Research Area (RAINS)

# Gheorghe Asachi Technical University

- [www.tuiasi.ro](http://www.tuiasi.ro)
- Founded in 1937 by Royal Decree as independent Higher Education Establishment
- 11 faculties:
  - Architecture
  - Automation and Computer Engineering
  - Civil Engineering
  - Chemical Engineering and Environment
  - Machine Manufacturing
  - Electrical Engineering
  - Electronics and Telecommunications
  - Hydrotechnics
  - Mechanical Engineering
  - Materials Science and Engineering
  - Textiles and Leather Technology

# Gheorghe Asachi Technical University

## ■ 5 Excellence Research Centres

- Polymers
- Computer System Engineering
- Integrated Production Systems
- Metrology and Measurement Systems
- Intelligent and Fuzzy Systems and Biomedical Engineering

## ■ And other 19 first-rate research teams

*Periodical assessment at national level by the  
National Council for Research in Higher Education*

# Gheorghe Asachi Technical University international programmes

- **3 Networks of Excellence** (Polysaccharides, Eurolignin and European Robotics Network )
- **1 Integrated project**
- **6 CRAFT or STREP** type projects
- **9 Marie Curie** individual fellowship
- **1 Marie Curie** Reintegration Grant
- **12 COST** projects in the field of transport, paper chemistry, environment

- **Faculty of Chemical Engineering and Environment:** the only one in the SE of Europe providing research and education services (diploma, master and doctorate) in the field of paper engineering
- Cellulose Chemistry and Technology – ISI ranked revue

### **Projects under FP6**

- ECOBINDERS-Furan and lignin based resin as eco-firendly and durable solutions for wood preservation, panel, board and design products
  - Bio-Value-Agricultural Whole-Crop Biorefinery:Development and evaluation of new integrated production concepts-FP7-KBBE-2007
  - BioCrop- Upgrading Forest Industry Waste to Value Added Bioactive Chemicals for Crop Stimulation and BioControl-FP7-KBBE-2008-2B
- 
- **Faculty of Textiles and Leather Technology** – unique in Romania

**Collaborating with Romanian  
researchers:  
the successful key factors  
and some  
“Achilles' heel” points**

**(a kind of) SWOT analysis**

# Weak points

- difficulties in coping with the **European financial rules** (low compatibility with the Romanian accounting principles and practice)
- **individualistic** approaches in project conception, management and valorisation (IPR)
- weak **team-working culture**: atomised staff structure and feeble social cohesion
- lack of experience in the **coordination** of FP projects
- **reversed pyramid** of ages and of academic qualifications



# Weak points

- tight base for the **recruitment of young researchers**
- linguistic and cultural **communication barriers**
- weak linkage with **economic sector**: breakdown of former industrial state enterprises, **unfriendly** economic environment for investing in innovation
- low level of **research valorisation**: patents, commercial contracts, spin-offs
- insufficient **intellectual property rights** knowledge and protection

# Opportunities: **FP7- direct costs**

- Personnel, travel, equipment expenditure
- **75%** : for non profit public bodies, secondary and **higher education** establishments, **research organisations** and SMEs
- **50%** : other organisations (e.g. large industry)

# Opportunities: FP7- indirect costs

- **Real indirect costs:** for participants having an analytical accounting system.
- **Simplified method:** real indirect eligible cost in accordance with usual accounting and management principles; based on actual costs
- **Special transitional flat-rate:** non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, which are unable to identify with certainty their real indirect costs for the project
  - 60% - for proposals closing before 01.01.2010
  - 40% - for proposals closing after 31.12.2009
- **Standard flat-rate: 20%** of total direct eligible costs

# Opportunities: NPRD&I (2007-2013)

## Capacities Programme

- **Proof of contracting** an FP7 project
- **All amount** of co-financing
- **Eligible expenditures:**
  - RD&I activities
  - Equipment procurement
  - Evaluation: measurements, analysis
  - Support activity: subscription fees, foreign invitees, diffusion of the innovation (patents, IPR protection)
  - Management, monitoring and audit activities

# Threats

- focusing the efforts towards the **national financing** (NPRD&I 2007-2013): bigger budget, weaker competition, no communication barriers between partners, **easier to catch money!**
- low level in the recovering of the **financial participation** at RTD&DA FP budget (less than 50% in FP6)
- lack of the entrepreneurial side of the research, due to the emergence of a public-financing **dependency culture (the perverse consequences of public funding)**

*The unity of Europe was  
a **dream** of few.  
It has become the **hope** for  
many and today it is a  
**necessity** for all*

**Germany Post-war Chancellor  
Konrad Adenauer**