



***NATIONAL INSTITUTE FOR RESEARCH
AND DEVELOPMENT OF ISOTOPIC AND
MOLECULAR TECHNOLOGIES,
CLUJ-NAPOCA, ROMÂNIA***

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The Evolution of the Institute

- **Started in 1950 as**
 - **PHYSICS GROUP of the ROMANIAN ACADEMY from CLUJ and evolved afterwards:**
- **1952 *5th SECTION OF THE INSTITUTE OF ATOMIC PHYSICS , MAGURELE***
- **1970 *INSTITUTE OF STABLE ISOTOPES, CLUJ***
- **1977 *INSTITUTE OF MOLECULAR AND ISOTOPIC TECHNOLOGY, CLUJ-NAPOCA***
- **1999 *NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT OF ISOTOPIC AND MOLECULAR TECHNOLOGIES, CLUJ-NAPOCA***

Departments and Facilities

- **DEPARTMENTS**

- **MASS SPECTROMETRY, CHROMATOGRAPHY AND APPLIED PHYSICS**
- **PHYSICS OF NANOSTRUCTURED SYSTEMS**
- **MOLECULAR AND BIOMOLECULAR PHYSICS**
- **PHYSICS AND TECHNOLOGY OF ISOTOPES**

- **FACILITIES**

- **PROTOTYPING WORKSHOP**
- **DATA CENTER**

Mass Spectrometry, Chromatography and Applied Physics

- *Mass spectrometry and chromatography*
- *Applied physics*
- *Applications of stable isotopes*
- *Isotope hydrology and environmental physics*
- *Thermal ionization*
- *Environmental application*
- *Molecular structure determination*



Isotopic ratio measurements

D, ¹⁸O, ¹³C, ¹⁵N, ³⁴S

from: waters, soil, air, plants

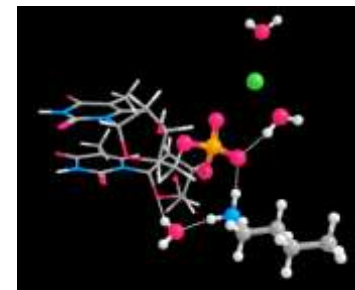
Physics of Nanostructured Systems

- *Nanostructured magnetic systems*
- *Nanostructured polymers and polymer based nanocomposites*
- *XRD techniques applied to nanomaterials*
- *ESR applied to multifunctional and nanostructured materials*
- *Supported nanostructured metal catalysts*
- *X-ray diffraction*



Molecular and Biomolecular Physics

- *Numerical molecular modeling*
- *Photothermal phenomena*
- *Molecular and supramolecular systems*
- *Molecular spectrometry: IR, RAMAN, UV-VIS, ESR, NMR, photoacoustic*
- *Applications of microwave-condensed matter interaction*
- *Biophysics and biomolecular physics*

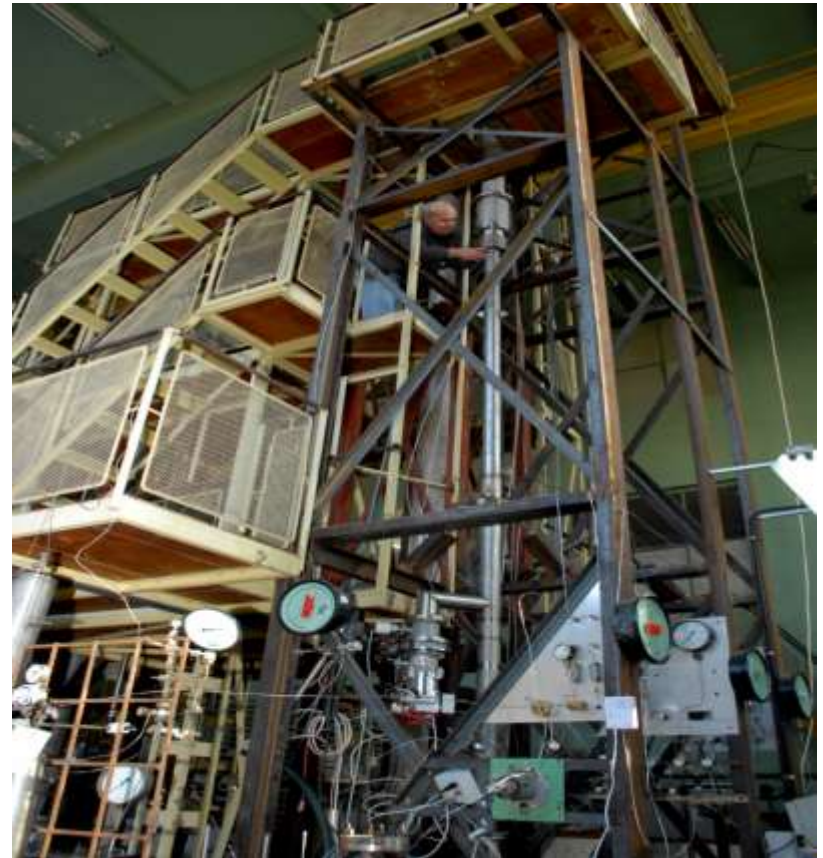


Physics and Technology of Isotopes

CRYOGENIC ^{13}C ISOTOPE SEPARATION UNIT

MADE in INCDTIM

- ***Studies and technologies for ^{13}C , ^{15}N and ^{18}O isotopes separation***
- ***Chemical and ionic isotopic exchange reactions***
- ***Synthesis of ^2D , ^{15}N and ^{13}C labeled compounds***
- ***Applied catalysis to hydrogen/deuterium exchange reactions***
- ***Production of stable isotopes labeled compounds***

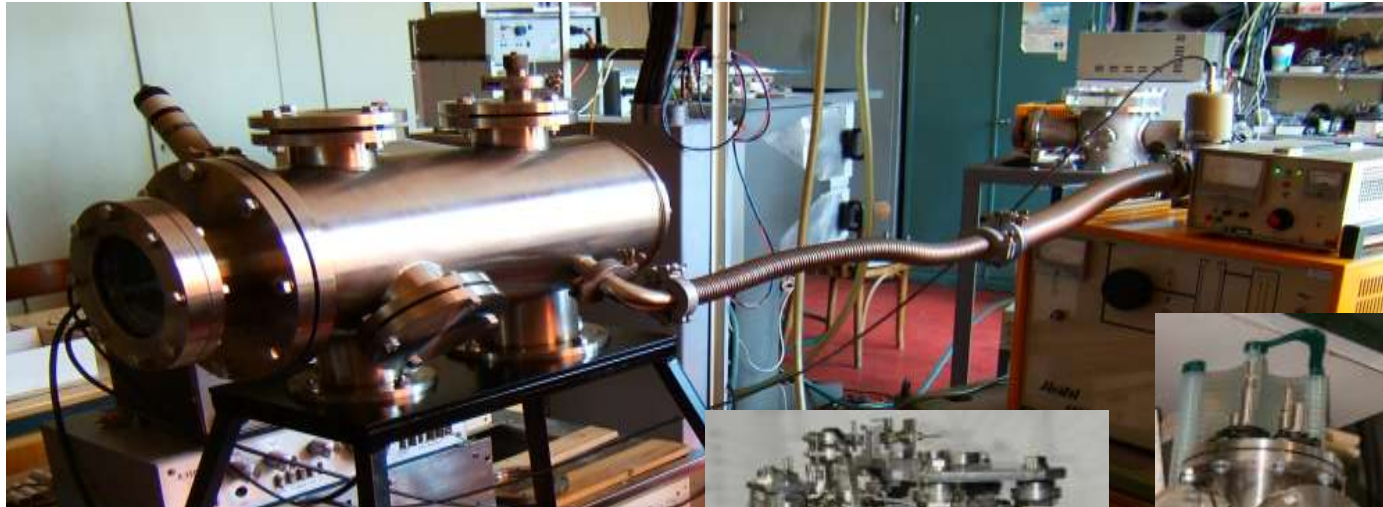


Prototyping Workshop

- ***Ionic components, vacuum systems and chromatography:***
 - *Traps*
 - *Passes*
 - *Diffusion pumps, etc.*
- ***Prototypes development for research applications***
- ***Prototypes executed for:***
 - ***CERN –ATLAS : The basket „superdrawers” of the hadronic calorimeter***
 - ***NIRDMP- Bucharest: nanoparticles thermal source, $T_{max} = 2000^{\circ}\text{C}$***
 - ***HH-NIPNE- Bucharest: reaction chamber $P=10^{-8}$ torr***
 - ***PALFINGER GmbH-Austria: robotic system for advanced technologies of surface cleaning***
 - ***INCDTIM -Cluj Napoca: ions sources for mass spectrometry***

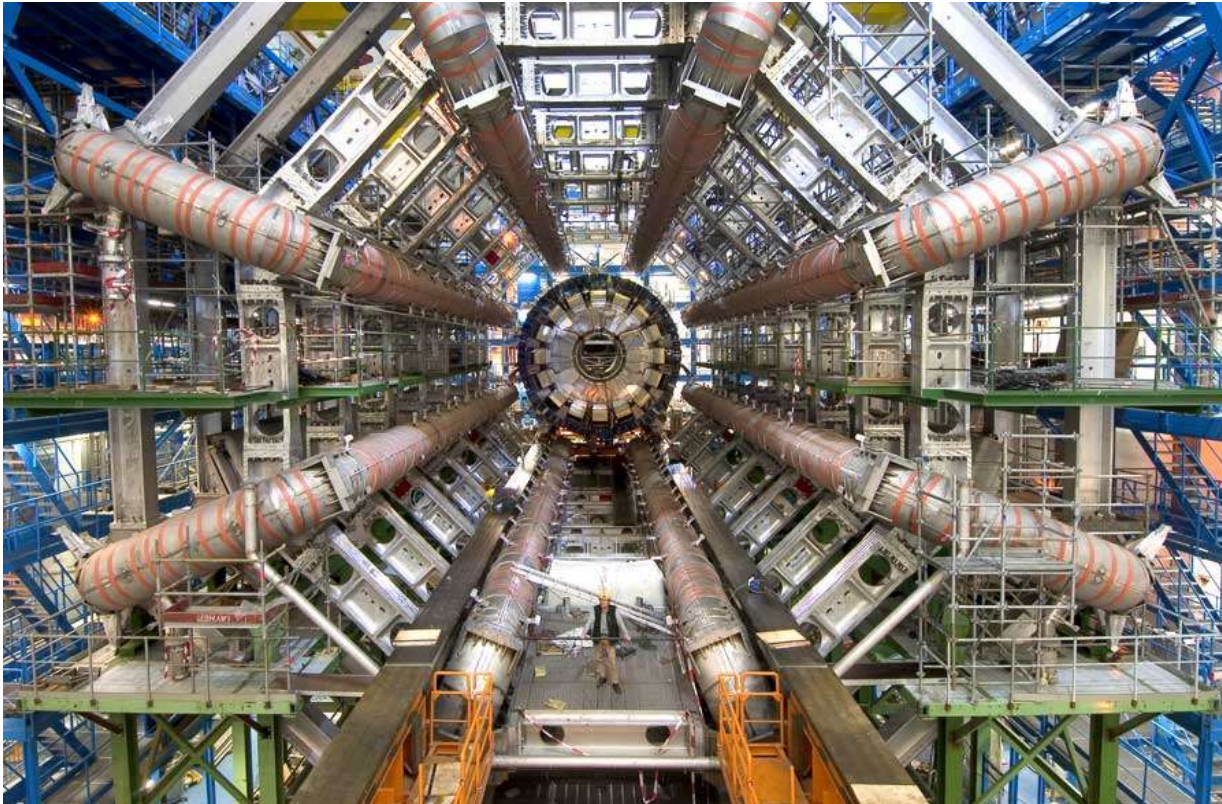


Products of the Prototyping Workshop

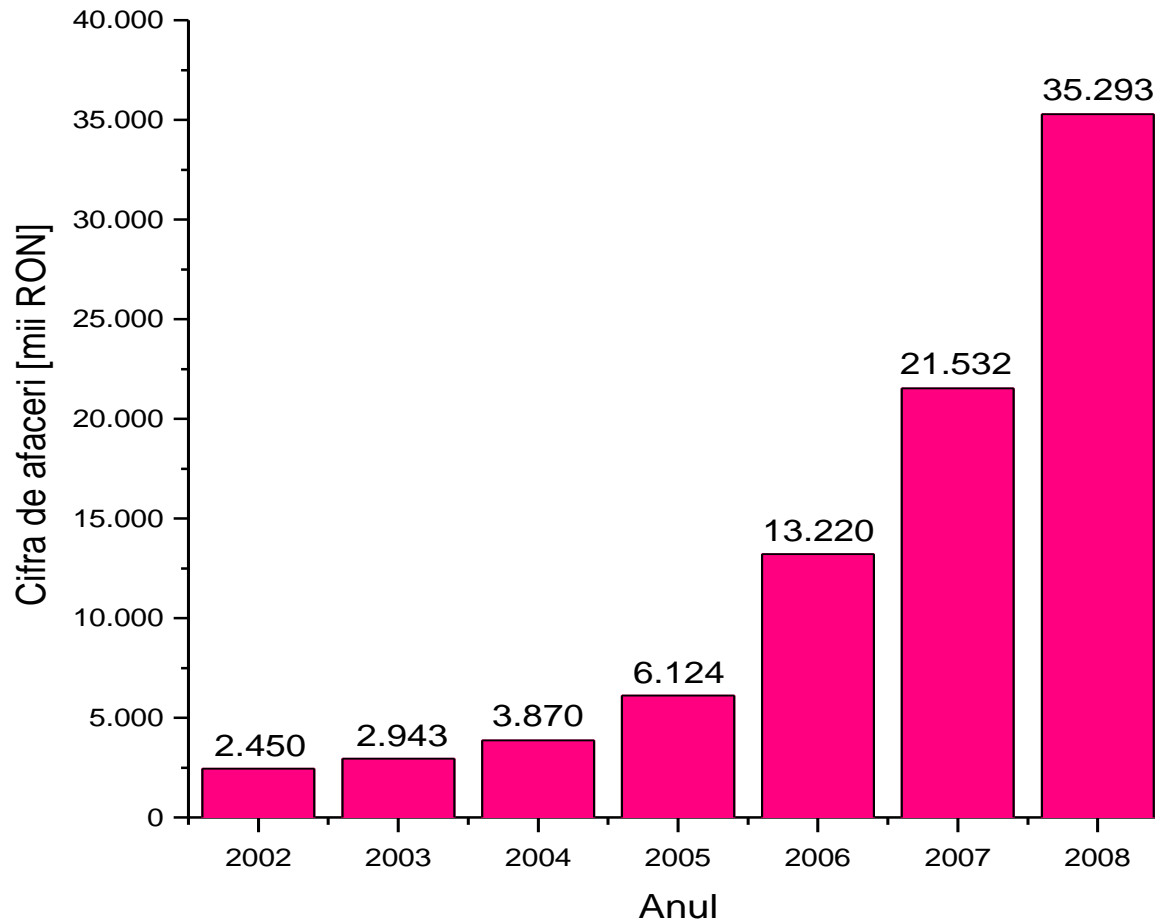


Data Center

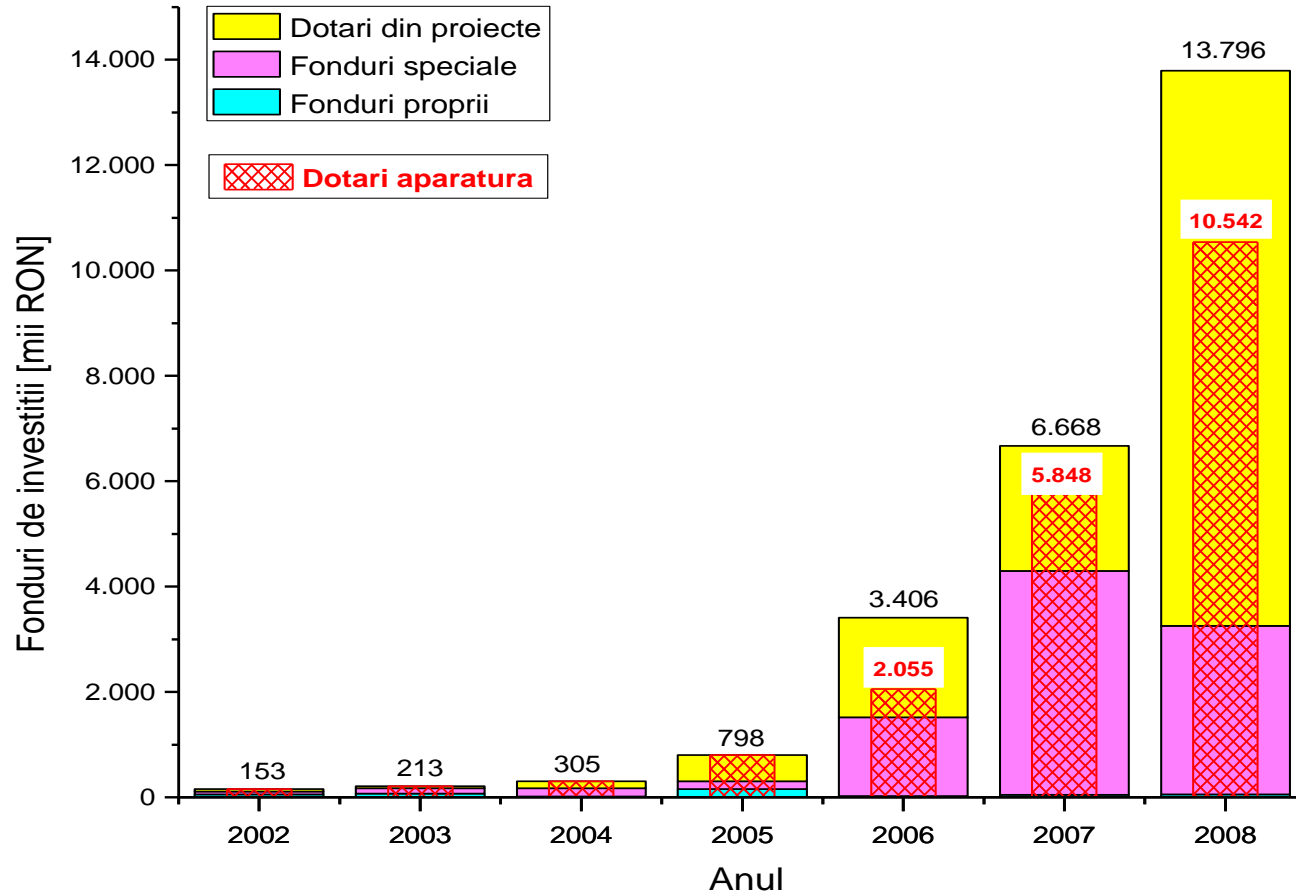
- *GRID-CERN network connection RO-14ITIM*
- *INCDTIM network connection*
- *Databases*
- *High performance theoretical molecular simulations*



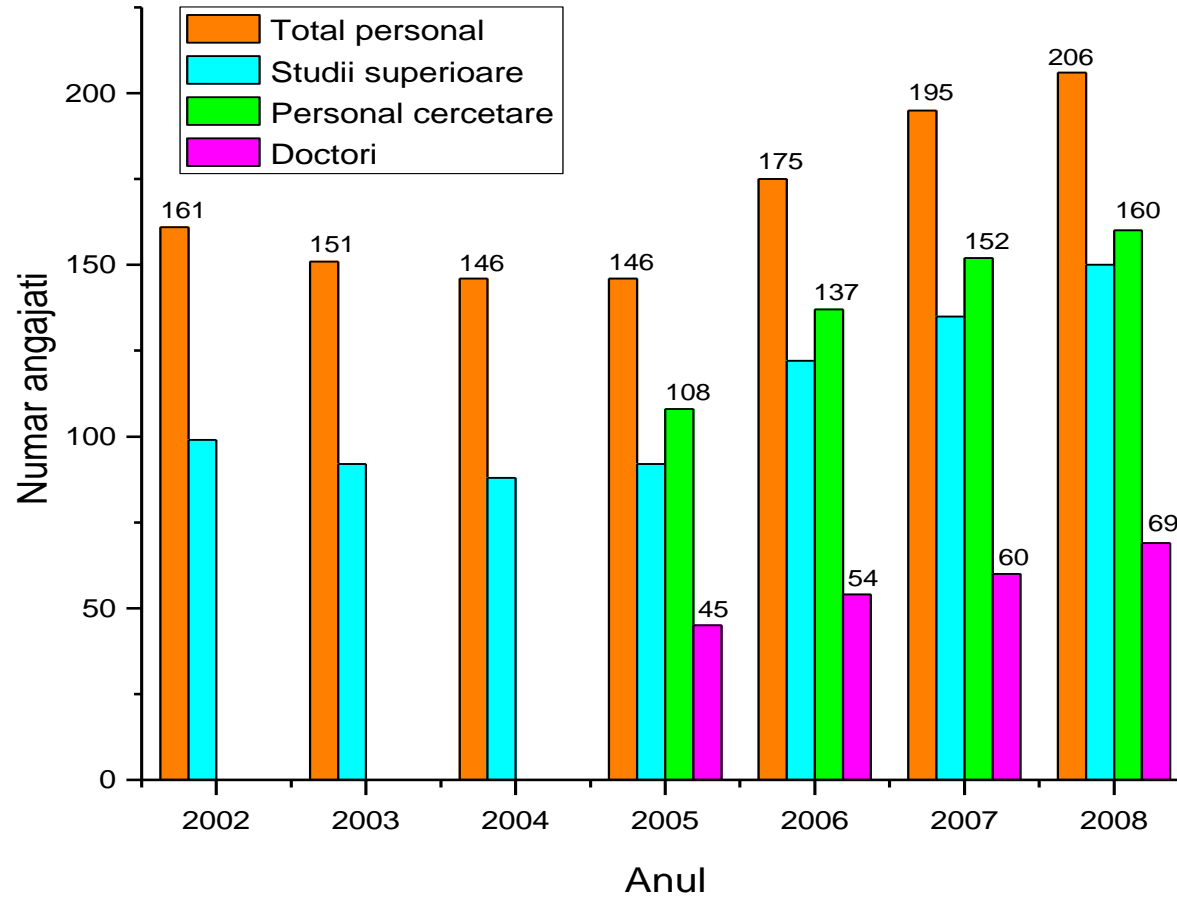
Evolution of Business



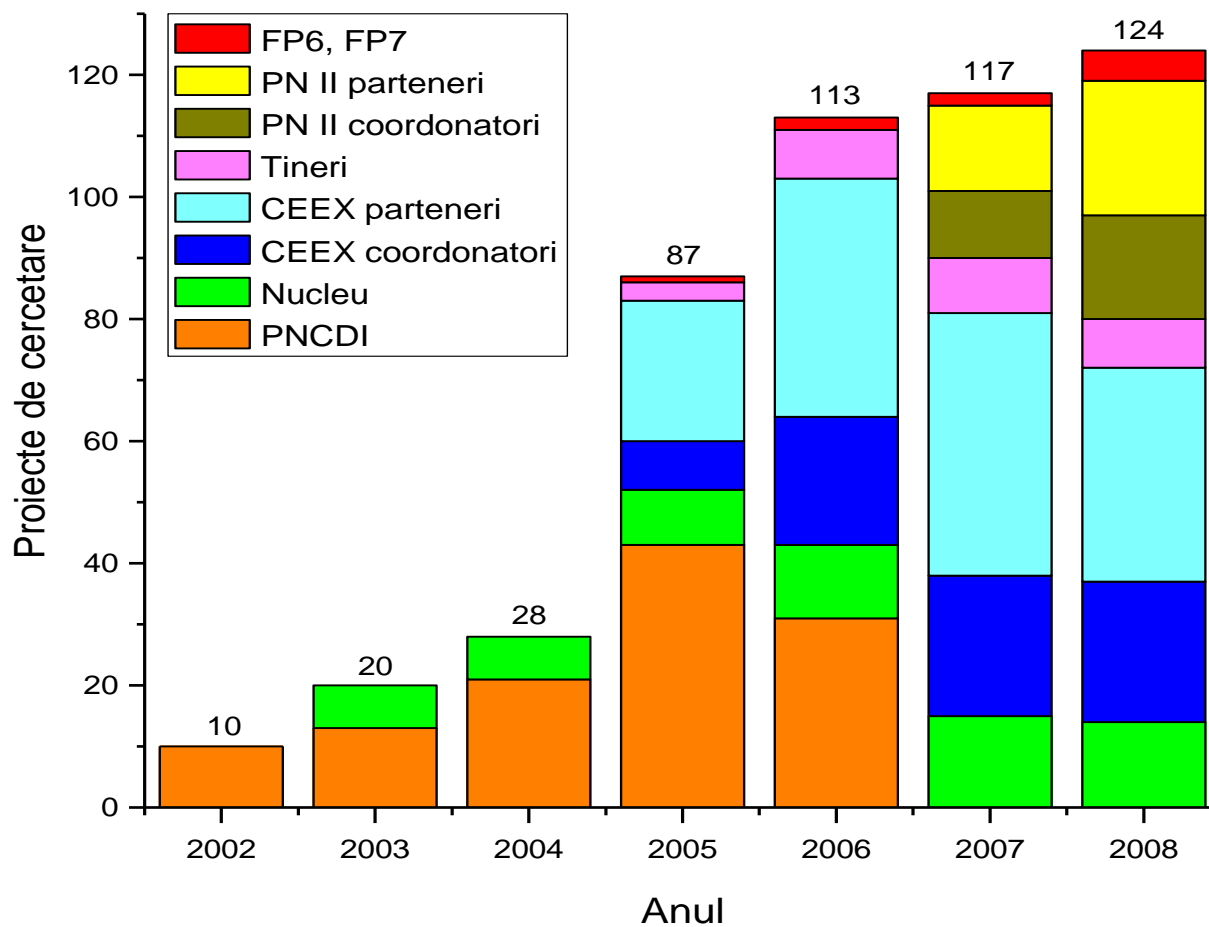
Investments



Evolution of Hired Personnel



Projects Engagements



Scientific Publications

