1995-today – **IFIN- Magurele** (National Institute for Physics and Nuclear Engineering). My positions were first as scientific researcher, then as scientific researcher degree III since 1996 while being part of the Section III, **Tandem** and part of the **Experimental Nuclear Physics Department**.

The output (see the publication list):

- *A method for elemental analysis of bones by recoiling atoms in heavy ion beams* (ERDA method devised by Prof.M.Petrascu, using ΔE-E detector built in our laboratory)
- *Neutron pre-emission probability at the fusion of ^{11}Li halo nuclei with Si targets in the 8-15.2 AMeV projectile energy range* (my contribution to the analysis of experimental data obtained by Romanian team at RIKEN, Japan)
- *Importance of the wave function tail in computing the pre-emission probability for the halo neutron from ^{11}Be fusion with light and heavy target* (my theoretical contribution to the proposal to change the target and one with a small experiment for a future RIKEN, Japan)
- *Array detector for neutron pre-emission investigations*

Was presented at conferences:

- *Dubna,Russia,1997 Sept., The VIth International school-seminar on heavy-ion physics*
- *Lewes, United Kingdom, 1998 17-19 June, Nuclear Structure at the extremes*.

While working for my PhD thesis at Section III (1995-2000), I collaborated to the bellow projects:

1. M. Petrascu, C.Bordeanu, A.Isbasescu, H.Petrascu, F.Negoita, L. Marinescu
Energetic calibration for the TANDEM accelerator (1999) using analog izomer isobar resonance in 13N, 14.214 MeV, by elastic scattering on carbon –
4940/18.11.1999 SUMM : 164.7125.267 lei
2. M.Petrascu, H.Petrascu, A.Isbasescu, C.Bordeanu
Extension '0' alignement for the TANDEM accelerator (1999)
3. M. Petrascu, C.Bordeanu, A.Isbasescu, H.Petrascu, R.Dima, L. Marinescu
Gas purity from inside the TANDEM accelerator measurements(2000)
4. M. Petrascu, C.Bordeanu, A.Isbasescu, R.Ruscu
Neutron Scintillation probes characterization using a 241AmBe neutron source (1999)
5. M. Petrascu, C.Bordeanu, A.Isbasescu, R.Ruscu
Neutron Scintillation probes characterization using deuteron beams from the TANDEM accelerator (d+Au) (1999)
6. M. Petrascu, C.Bordeanu, A.Isbasescu, H.Petrascu
Biological probes characterization using ERDA method (bones, brain tissue) (1998-2000)
7. M. Petrascu, D.Pantelica, C.Bordeanu, A.Isbasescu, H.Petrascu
Thin sample profiling using nuclear methods (1998-2000)
8. C. Bordeanu
Programs for experimental data analysis in beam by recoil atoms element analysis (1999)

9. M. Petrascu, C.Bordeanu, A.Isbasescu, I.David
Characterization of material impurities by atoms recoil method (1997) 16O+27Al
10. A.Fomicev, M.Petrascu, C.Bordeanu
Energy calibration and efficiency curves for thick Si detectors for Dubna
11. C.Bordeanu
Programs for determining the pre-emission probability for the halo neutrons for the fusion of 11Be with light and heavy targets (1998)
12. C.Bordeanu
Programs for determining the pre-emission probability for the halo neutrons for the fusion of 11Be with light and heavy targets (1999)

Grants

1. M.Petrascu, A.Isbasescu, H.Petrascu, C.Bordeanu, I.Cruceru, M.Giurgiu, I.Tanihata
Experimental measurements and theoretical calculations for the neutron pre-emission when halo nuclei interract with light targets
SCIENCE ACADEMY GRANT 79/1999 (January)
Summ: 17 million lei
2. M.Petrascu, A.Isbasescu, H.Petrascu, C.Bordeanu, I.Cruceru, M.Giurgiu, I.Tanihata
Halo 11Li nuclei fusion investigation to Si light targets in energy range 15-25 AMeV
GRANT ANSTI 5194/1999 (3 years)
For 1999 year, summ: 25 million lei

Unique product used abroad

1. M Petrascu, C.Bordeanu, I.Cruceru, A.Isbasescu, D.Mangeac, R.Ruscu, H.Petrascu, C.H.Giolu
Array neutron detector: design and construction, delivered to RIKEN-Japon (I.F.I.N. 1997-2000)

International experimental arrangement

1. M.Petrascu, C.Bordeanu, I.Cruceru, A.Isbasescu, R.Ruscu, H.Petrascu, M.Giurgiu, I.Tanihata, A.Ozawa, K.Morimoto
International experimental arrangement for the halo 11Li nuclei fusion investigation to light targets – accomplished at RIKEN-Japon in 2000

Member of a research team responsible for the development of an international project

1. Collaboration to Institute of Physical and Chemical Research RIKEN-Japon (1997-2000)

POSITIONS WON IN INTERNATIONAL COMPETITIONS

1	RIKEN, JapAN	Nuclear Physics	1998/ 3 months	Fellow Ministry of Education, Culture, Sport, Science and Technology din Japan

2	Weizmann Institute of Science, Israel	Nuclear Physics and Nuclear Astrophysics	2000-2002	Postdoctoral Fellow "The Edmond I. & Lillian S. Kaufman Postdoctoral Fellowship"
3	University of Washington, Seattle, SUA	Nuclear Astrophysics	2003-2005	Research Associate DOE
4	Western Michigan University, SUA	Radiation fields simmulations	2008/ 1 month	Co-director project Grant at the APS-International Travel Grant Award */Research associate
5	ATOMKI, Debrecen, Hungary	Nuclear Astrophysics	2010-2012	Project Investigator/ project director) NKTH-OTKA-EU FP7 (Marie Curie Actions) HUMAN-MB08 B

December. 2005 - **September 2010**, I collaborated in projects CEEX M3/2006 (project director Dr. Florin Carstoiu), PN 06 35 02 01/2006 (project director Dr. Dan Pantelica), IMPACT (project director Dr. Florin Negoita, the goal was establishing an underground laboratory for Nuclear Astrophysics in a salt mine in Romania) and worked for different beam time activities in the department accelerator.

I applied to ANCS (National Authority for Scientific Research), CNCSIS (National Council of Scientific Research in Higher Education), CNMP (National Center for Program Management), to national competitions, writing over 11 projects, all projects themes connected to Nuclear Astrophysics, without success.

PARTNERSHIP:

/2008, ASTROSAL **"Physical-geological study of several multidisciplinary salt deposits in order to optimize the construction and operation of a nuclear astrophysics laboratory in a saline"**

/2008 ASCAVSAR **"Physical-geological multidisciplinary study of salt deposits fields: Ocna Dej, Praid, Targul Ocna, Cacica for optimal location of an electrostatic particle accelerator"**

/2008 **"Methodologies and tools for designers of high-frequency integrated nanostructures"**

CAPACITIES :

Modul I/2007 ASTROECHIP **"Low background measurements in a few salt mines in Romania for the location of an astrophysics laboratory: equipment procurement and construction of excellence instrumentation"**

IDEAS:

/2007 "**Measurements of reaction cross-sections of Nuclear Astrophysics interest using stable beam accelerators: theoretical modeling and measurements for the stopping power and electronic shielding around the Gamow peak"**

/2008 **"Calculation and determination of the stopping power and electronic shielding of interest to Nuclear Astrophysics"**

COMPLEX IDEAS:

/2008 **"Determination and characterization of sources of radiation in the Praid salt mine. Biological effect evaluation of these sources. Development of a method of reducing the concentration of Rn in the detection spaces"**

/2008 **"Direct measurements for key nuclear reactions in Nuclear Astrophysics using stable beams and new methods to reduce the natural background radiation at the ground level and underground salt mines"**

HUMAN RESOURCES:

/2008 **"Options and needs for an underground accelerator based lab for nuclear astrophysics"**, Homestake DUSEL initial suite of experiments (ISE) Workshop, April 20-26, Lead, South Dakota, USA

I participated in **international conferences** in order to promote a project dear to me, to build an underground laboratory dedicated to basic research in Nuclear Astrophysics a salt mine in Romania (**see the conference list**).

I invited several personalities from the world of physics, to lecture at the institute seminars and they visited us:

- - Prof. **Michael Hass** from the **Weizmann Institute of Science,** Israel on issues of nuclear astrophysics and nuclear magnetic moments,
- - Prof. **Oded Heber** the **Weizmann Institute of Science**, Israel on atom and molecule themes and computational control of the accelerator,
- - Prof. **Claus Rolfs** of **Ruhr University (Bochum**), Rubion on nuclear astrophysics problems and the need to set up a laboratory in an underground salt mine
- - Prof. **Zsolt Fulop**, **CEO ATOMKI**, Debrecen, Hungary on issues of nuclear astrophysics.

In 2008 I obtained scientific researcher II degree, following a competition.

In **2008 I applied to an international competition at APS (American Physical Society) and I won a $2000 grant (I was co-director together with Prof. Michael Famiano from the Western Michigan University) at the International Travel Grant Award**, http://www.aps.org/programs/international/programs/upload/ITGAP-Recipients-All.pdf . The goal was to perform preliminary calculations for the radioactivity field at an underground laboratory for Nuclear Astrophysics at DUSEL (Deep Underground

Science and Engineering Laboratory) Homestake, USA. The activity was developed in Western Michigan University, Physics College, together with Professor Michael Famiano. I contacted Professor Michael Wiescher too, from the University of Notre Dame, IN, USA.

In the U.S., the APS holds two such competitions annually. Each competition is only winning by two competing projects.

The grant permitted me to work for one month on this subject. I was financial supported by NATO (North Atlantic Treaty Organization) (through a Prof. Michael Famiano's project), by the Kalamazoo Physics Department too and by the Romanian PN 06 35 02 01 project.

Since 2009, I am part of the DFN department project PN 09 37 01 05 (project director Dr. Nicolae Marginean, the head of the department).

In 2009, I applied with international projects in international competitions, as member or director of the project:
1-**ELENA at Science & Technology Facilities Council (STFC - UK),** project director Dr. Marialuisa Aliotta – **I was a key person in WP3** (work package)
2-**DUSEL at National Science Foundation (NSF – USA),** program director for Nuclear Astrophysics: Profesorul Michael Wiescher from Notre Dame University, USA – **as collaborator**,
3- **EuroGENESIS at European Science Foundation (ESF),** project director Dr. Jordi Jose – **I was Principal Investigator for the IP6 (individual project), part of the CRP3 (collaborative Research Project)**.

ELENA project is waiting, in the UK, on a long waiting funding list.

DUSEL project became DURA (Deep Underground Research Association), as changing NSF funding agency to DOE (Department of Energy); interest groups continue preparations in anticipation for the final configuration and real financier.

EuroGENESIS comes to an end this year (2013) but without the Romanian contribution. The Romanian PAC didn't admit carrying out the two experiments to the TANDEM accelerator and removed, from the department project PN, the parts involved in developing the experiments proposed in the project.