



**Lobachevsky State University
of Nizhniy Novgorod
(*National Research University*)**

Roman Strongin (President)

***Education and Science as
Drivers of Development***

***2011 TII Annual Conference
“Innovation, Prosperity, Quality of Life”
Nizhniy Novgorod, 26-28 May, 2011***

*The Goal of this Presentation is
to Elucidate the Banner Headline*

***“Education and Science as
Drivers of Development”***

*by Exposing the Role of a Particular University
in the Development Process*

The Particular University is

Lobachevsky State University of Nizhniy Novgorod (National Research University)

UNN Includes:

- 19 Departments (Faculties),***
- 136 Sub Departments (Chairs),***
- 5 Research Institutions,***
- 9 Branches at the Industrial Zone of Nizhniy Novgorod***

Studying at UNN :

over 41 000, including 900 of PhD students

Performing Training and Research:

over 1000 Doctors of Philosophy and over 340 Doctors of Science (Russian Post PhD top Degree for Research)

**What such a University
can Do
for Development?**

University Project

“Building the Center for Innovative Development of Medical Instrument Engineering on the Base of UNN”

is Included into Federal Program (2011-2016) with financing about 51 million US dollars.

The Goal is

to Develop (with Partners from Industry and Russian Academy of Sciences) the Center of Competence for Medical Instrument Engineering and High Biomedical Technologies

Clusters to be Created are:

Educational, Research, Innovative, Manufacturing and Medical

**This Project is just about to
Start.**

**Could we anticipate it to become
a Driver for Development?**

**Do we have such an Experience
in the Past?**

Department (faculty) of *Radio Physics* **Established at UNN in 1945 (First in the USSR)**

Founders of the Faculty



Academician A.A. Andronov
Founder of the «Nonlinear Thinking»



Professor M.T. Grekhova
First Dean of the
Radio Physical Faculty



Academician V.L. Ginzburg
Chairman of the Department
of Radiation and Propagation
of Electromagnetic Waves.
Chief Editor of the Magazine
“Radio Physics”
Nobel Prize Laureate

Results:

*The City Became the Soviet and the Russian **Capital of Radiolocation** — the Recognized Center of:*

- *Wave Phenomenon Studies (in Different Media);*
- *Effective Design and Production of Radar Systems*

***Department (Faculty) of
Computing Mathematics and Cybernetics
Established at UNN in 1963 (First in USSR)***



***Founder
Professor Yu.I. Neimark
N. Wiener Prize and
A. Andronov Prize Laureate***

***Now the City is the Recognized Center
in Information Technologies***

The Lobachevski State University Project

**“Education and Research Center
“Information and Telecommunication
Systems: Basic Physics and Software”**

became (2006) one of the winners within the National Priority Project “Education” with financing about 25 million US dollars.

Additional Project (2007):

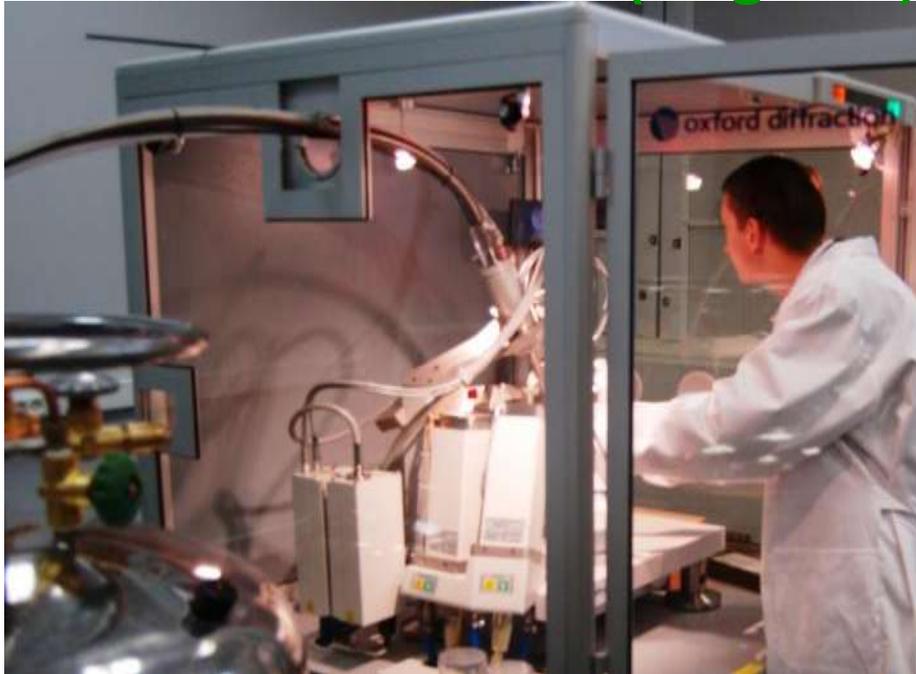
“Establishing at UNN the new Center for Nana Industry” (\$5.38 million)

This Dramatically Improved Facilities for Research and Education and made the University more Attractive for its Partners

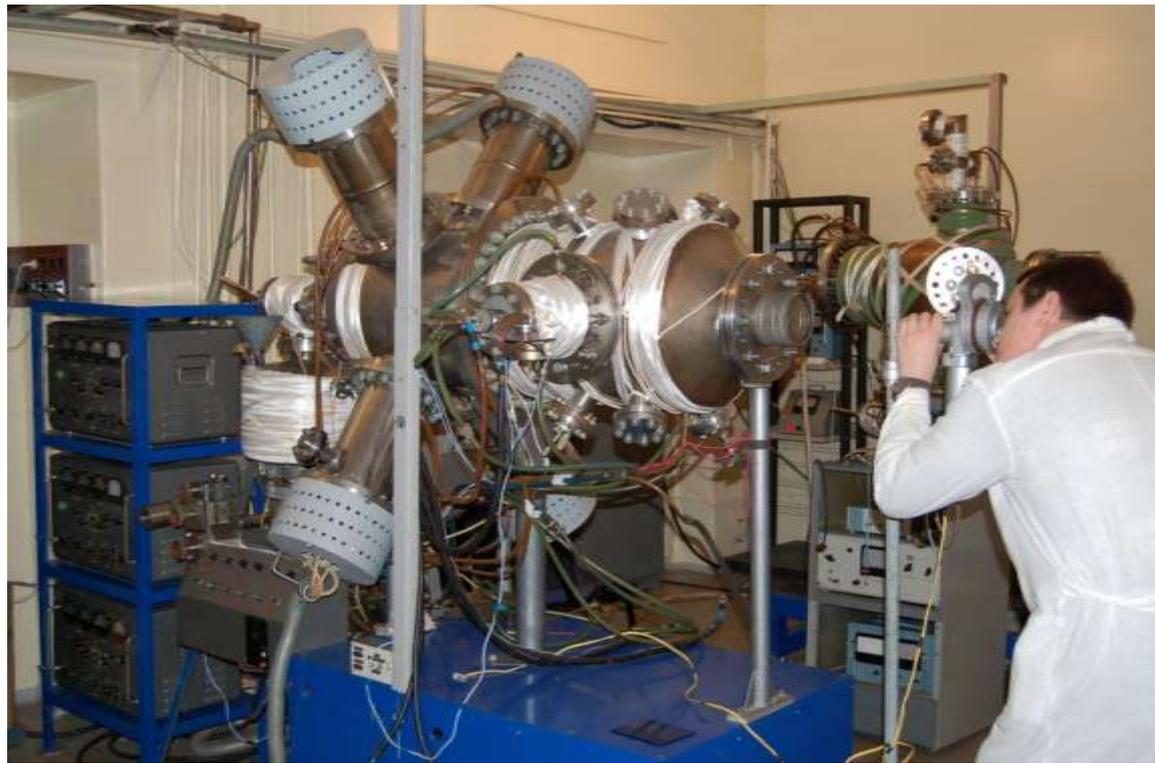
New Equipment for Physical Metrology

*Scanning electron microscope
“JEOL” (Japan)*

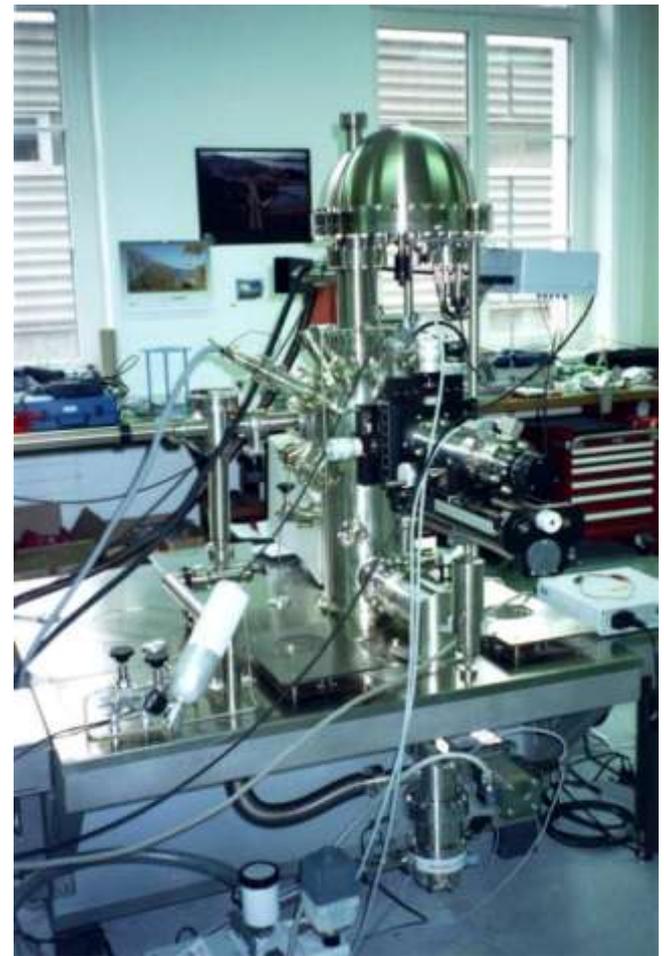
*Automatic X-ray diffractometer
“Oxford diffraction” (England).*



*Bruker EMX/060310-CM” (Germany)
for paramagnetic resonance EPR
spectrometer” research in solids.*



Laboratory of Nano Structured Semiconductors



Best Equipment (in its Class) in Russia

Materials

New *aluminum-silicon alloy materials* with *nano* crystal structure reach a *record plasticity (700%)*.

The Study was prolonged in the frame of Russian-American Program Grant (2008-2009):

«Foundations and methods for grain boundaries design to ensure low-temperature superplasticity of nanocrystalline metals and alloys»

Modeling Dynamic Processes in the Myocardium

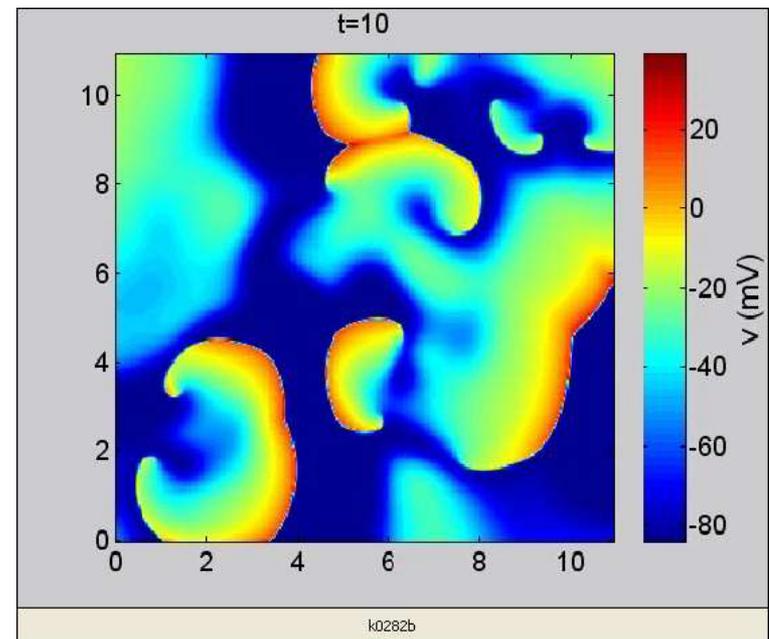
Objective. Search for Effective (sparing) Methods to cure Principal Types of Cardiac Arrhythmia: Tachycardia and Fibrillation.

Suggested Model is based on implementing $300 \times 300 \times 100$ cell net to cover the myocardium. The cell state is described by 6 variables. Total amount of variables is **55 millions.**

Impact of Electricity is modeled by introducing some stimulating current into the system of differential equations.

Pharmacotherapy – by changing the conductivity parameters of ionic channels.

Reproduction of principal dynamic modes in myocardium: solitary spiral waves, driving centers, chaos of spiral waves.



Spiral Chaos in Myocardium while passing from normal Rhythm to Fibrillation.

New Extra Quality Courses in Information Technologies

- ***«Programming Technologies»*** (based on the Microsoft Solutions Framework) is the ***Winner of the “Microsoft Software Engineering Contest 2006”***.
- ***«Methods and Means for constructing Distributed Programming Systems using “Java” Technology»*** is the ***Winner of the Contest “Sun Microsystems Teaching Grants 2006”***.
- ***«Theory and Practice of Computing for High Performance Cluster Systems»*** is the ***Winner of all Russian Contest of Educational Programs for the contemporary Multi Core Processing Systems (Intel Company; 2006); In use at 20 Russian Universities (Educational Support Block for the Operating System MS Windows Compute Cluster Server)***

Microsoft "Imagine Cup" World Final (2009) Students Contest (77 countries)

Software Design Award

Second place

Team: Vital Lab

Country: Russia

Maxim Bovykin

Denis Gnatyuk

Alexey Klichin

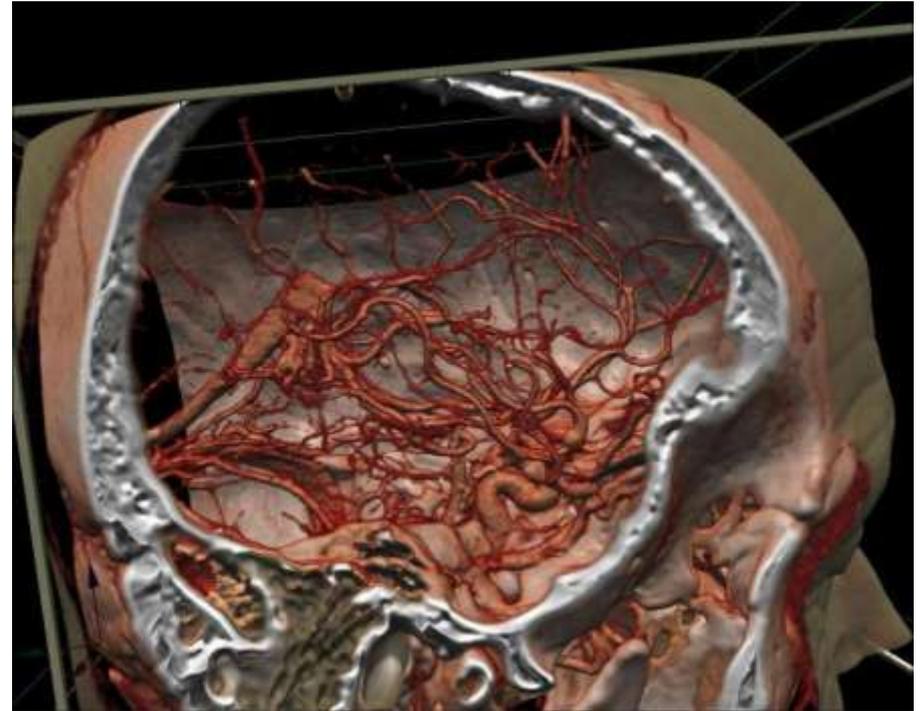
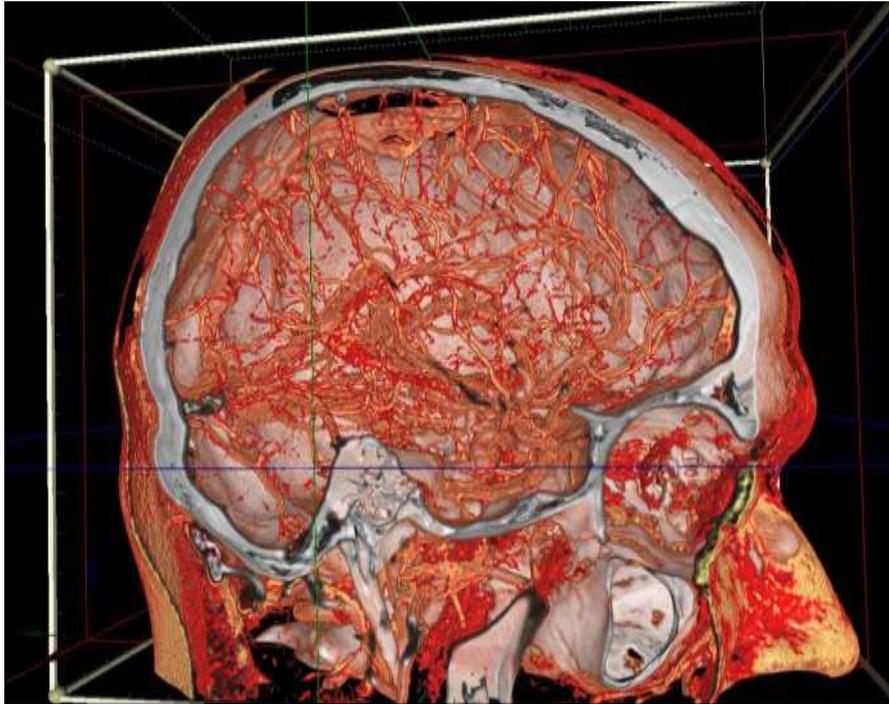
Sergey

Microsoft

UNN
TEAM



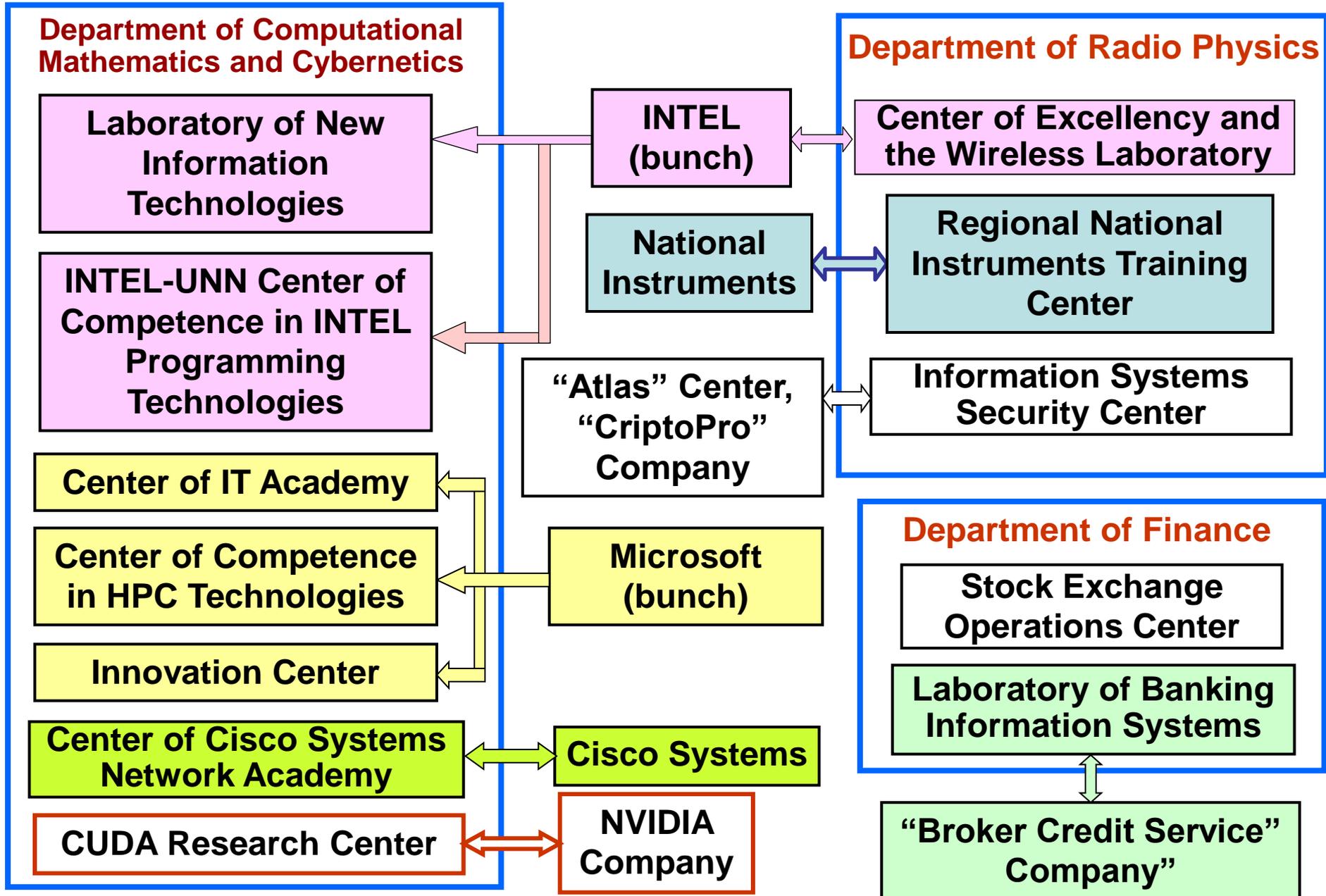
3D Virtual Tomography Software Elaborated by the Students' Team



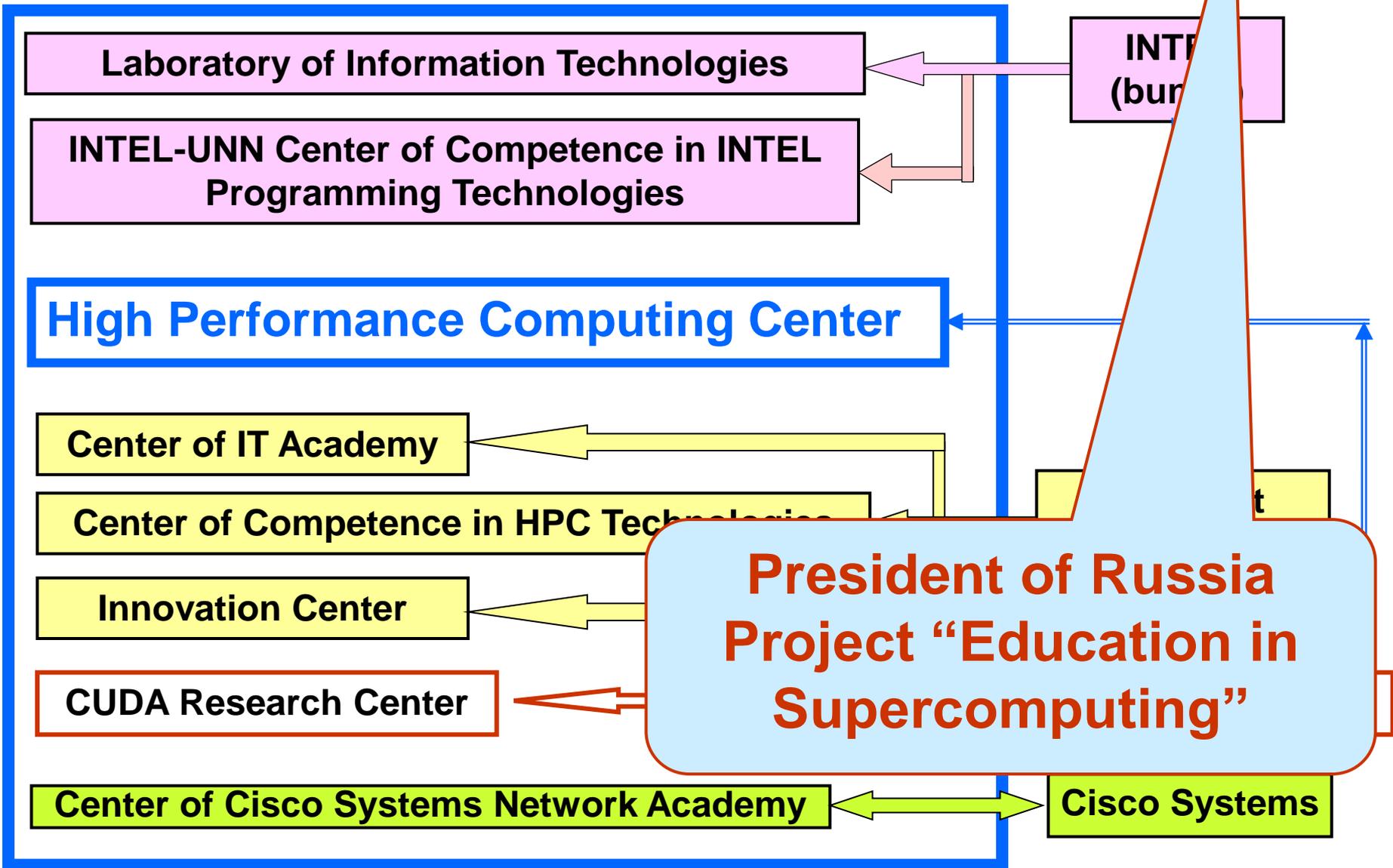
Some Interests of Partner Companies to Collaborate with University are:

- *in enriching its Sources for Innovation (supporting new projects and ideas);*
- *in attracting (by additional education, training, practical placement) Talented People to work in its area of research and development or at its Local Division;*
- *in Expanding Markets for its Technologies by advertizing “in action” (demonstration, teaching and approving the abilities by licensing, trial installing, etc.);*
- *in Improvement of Educational Means supporting implementation of its technologies, etc.*

Some of UNN Links with High-Tech Information Companies



Volga Federal District Research and Educational Center of Supercomputer Technologies (Project of Projects)



**Signing Strategic Agreement
of Intentions (February, 2009)**

UNN -- Intel®

(first for the Russian Universities)



***"Development of Cooperation with UNN is
Strategically Important for INTEL"***

***Dusty Robbins
the Leader of INTEL
Software and Services Group
March, 2009***

Bill Gates included UNN in the List of Ten Universities - "Microsoft" Partners

ЛУКОЙЛ



Signing the Agreement of Intentions with Microsoft

***Rector of UNN
E.Chuprunov***

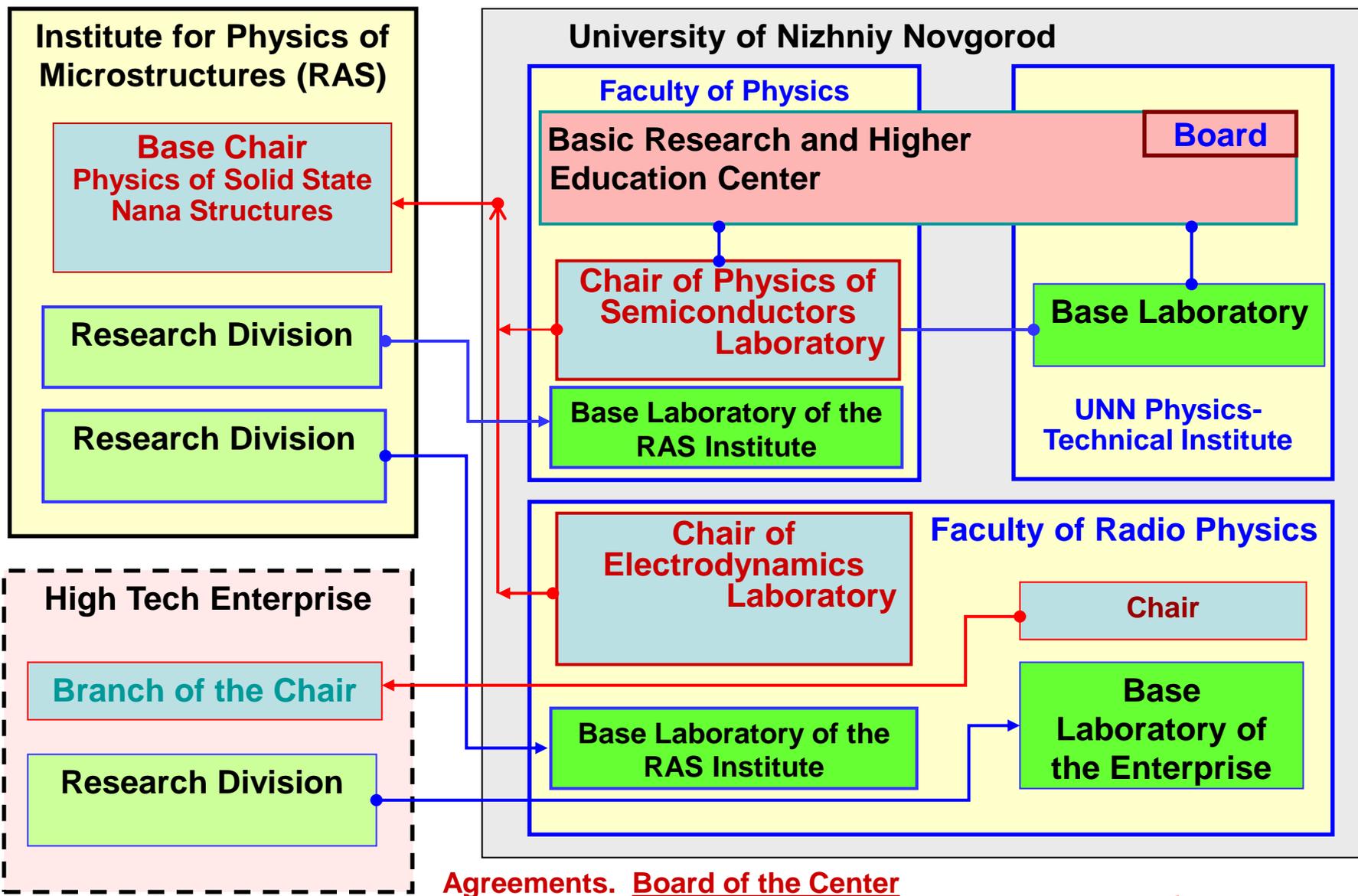
***President of «Microsoft Rus»
N. Prianishnicov***



2010

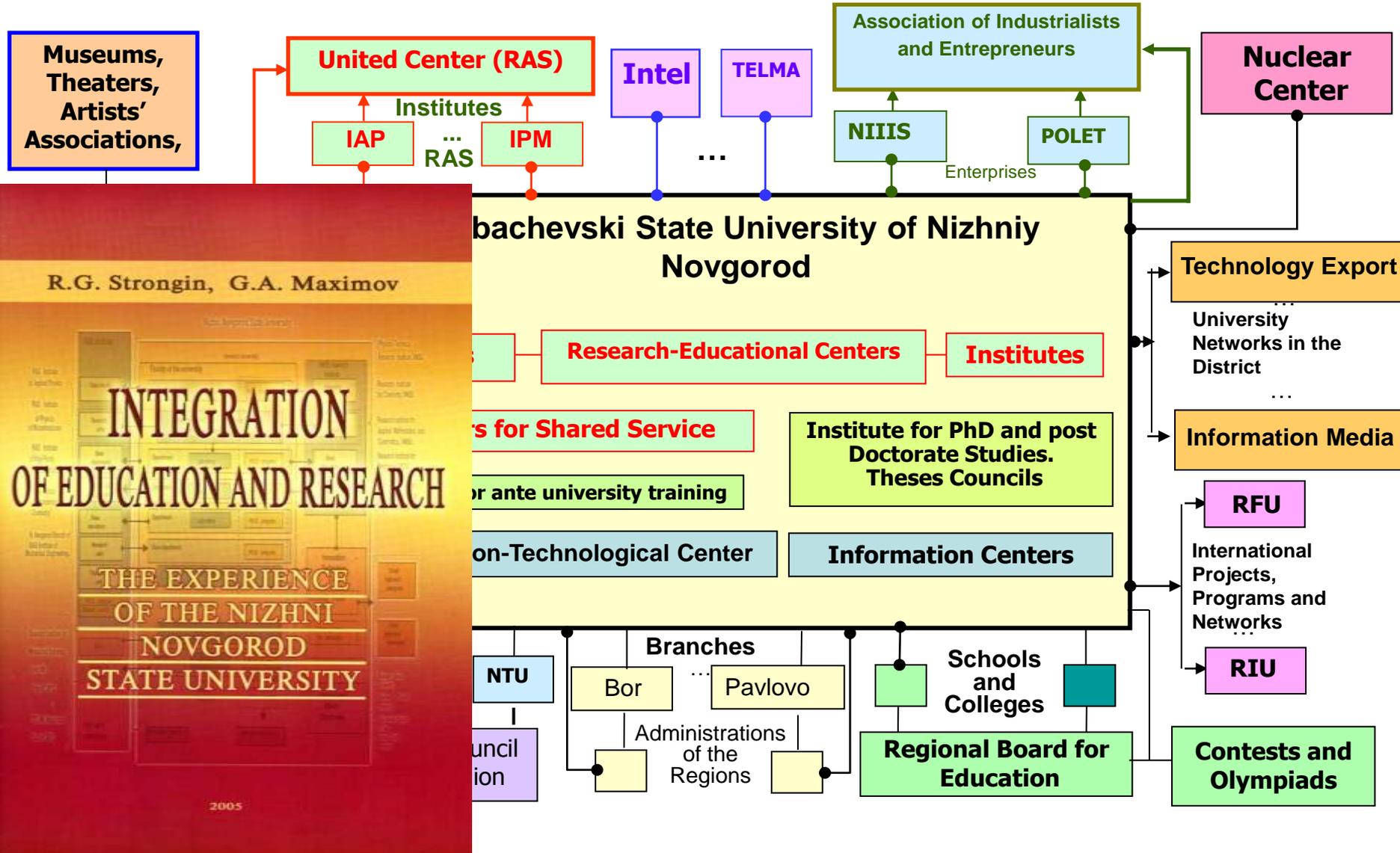
Educational, Research and Innovation Center "State Solid Physics"

Nana Electronics for Information Technologies



University as the Center of Integration

Networks of Interaction



Mechanism → **Agreements (Training Human Resources + Joint Research)**

International Recognition
of the University Projects
in Education

International Mobility Projects

Title of the European Commission Tempus Tacis Project	Index and Period of Execution	Financial Support
<i>Mobility and Recognition in Financial Studies</i> <i>(<u>Dual Diploma Program</u>)</i>	M_JEP-10461-98 1999-2001	€787202

An Example

**UNN Partners: University of Calabria (Italy) &
Roskilde University (Denmark)**

***This was before Bologna
Declaration***

Russian-Italian University
(Economics, Finance, Informatics, Mechanics)

Some Other International Projects Fostering University Strategic Development

Title of the Project	Index and Period of Execution	Financial Support
Becoming an Entrepreneurial University (Tempus Tacis)	UM_JEP-22240-2001 2002-2004	€296534
Analytical Master for Improved Economic Expertise (Tempus Tacis)	CD_JEP-23229-2002 2003-2005	€483474
Project-Oriented Methods in Russian Universities (Tempus Tacis)	SCM_T023B05-2005 2006-2008	€149160
University Knowledge transfer for Sustainable Growth (Tempus Tacis)	UM_JEP-26017-2005 2006-2009	€472200
Creation of the University Analysis and Planning Support Office: Ensuring Strategic Planning Sustainability	IREX 2005	\$20 000
Endeavour: Entrepreneurial Development as a Vehicle to Promote European Higher Education	Erasmus Mundus Project #2006- 2859/001 MUN-MUNB41	€340 800

Thanks for Your Kind Attention!



**Lobachevski State University
National Research University**



President

Vice President of the Russian Union of Rectors

Professor, D.Sc. (Physics & Mathematics)

Chairman of Software Department

***Doctor of Sciences Honoris Causa (London
Metropolitan University)***

Honorary Freeman of Nizhniy Novgorod City

Chairman of the Nizhniy Novgorod Public Chamber

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