Objectives of
research e-infrastructure development
in Latvia

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Content

1. **Basic data about IMCS UL**

2. **E-infrastructure development in IMCS UL, Latvia**
    (Latvia, Baltic, Eastern Europe)

3. Main factors which have the greatest impact on
development of e-infrastructure

- ► International collaboration;

- ► National research development policy;

- ► Outsourcing possibilities of e-infrastructure;

- ► Global cooperation and/or competition;

- ► Public private partnership in development of e-infrastructure.

Basic data about IMCS UL, Latvia University

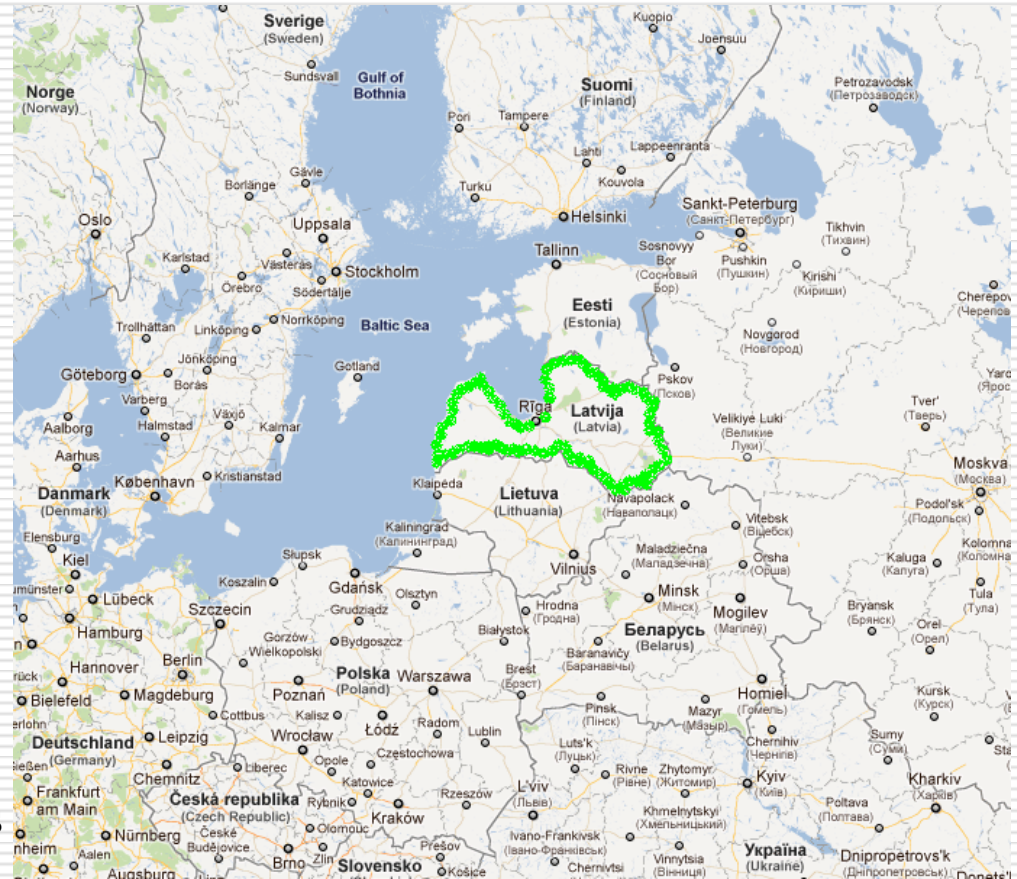Latvia - Baltic region of Northern Europe
The territory covers 64,589 km2
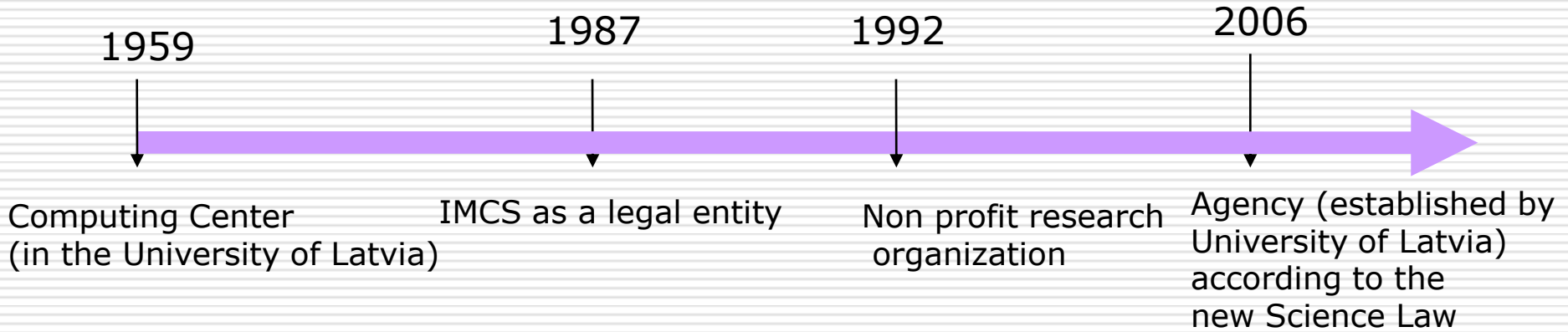Population - 2,248,000 peoples

University of Latvia biggest in Baltic States:
In the academic year 2011/ 2012, the total number of students enrolled at the University of Latvia (UL) comprises 17,790

9 Research institutes-legal bodies

IMCS UL was founded in 1959 and it is the leading Latvian research institute in computer science and mathematics

1959

1987

1992

2006

Computing Center
(in the University of Latvia)

IMCS as a legal entity

Non profit research organization

Agency (established by University of Latvia) according to the new Science Law

All time:

► Togetherness with University of Latvia
  (name, part time professors, master program , e.g.);

► Institute status (services) in the country.

Main research fields in IMCS UL are:

- Computer Science

- ► Mathematical foundations of computer science
- ► Complex systems modeling languages and development tools
- ► Graph theory and visual information processing
- ► Semantic web technologies
- ► Real time systems, embedded systems
- ► Computational linguistics
- ► Bioinformatics

- Mathematics

- ► Mathematical modeling for technologies and natural sciences
- ► Theoretical problems of mathematical methods

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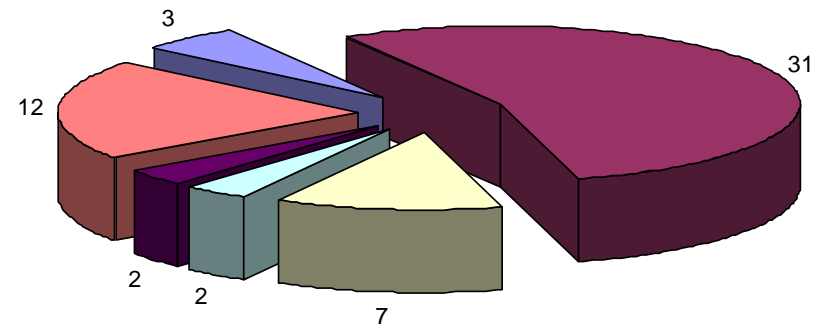
Staff's current qualification

Total number 214

Number of doctors (69)

Legend:
- Mathematics
- Computer Science
- Philology
- Engineering
- Physics
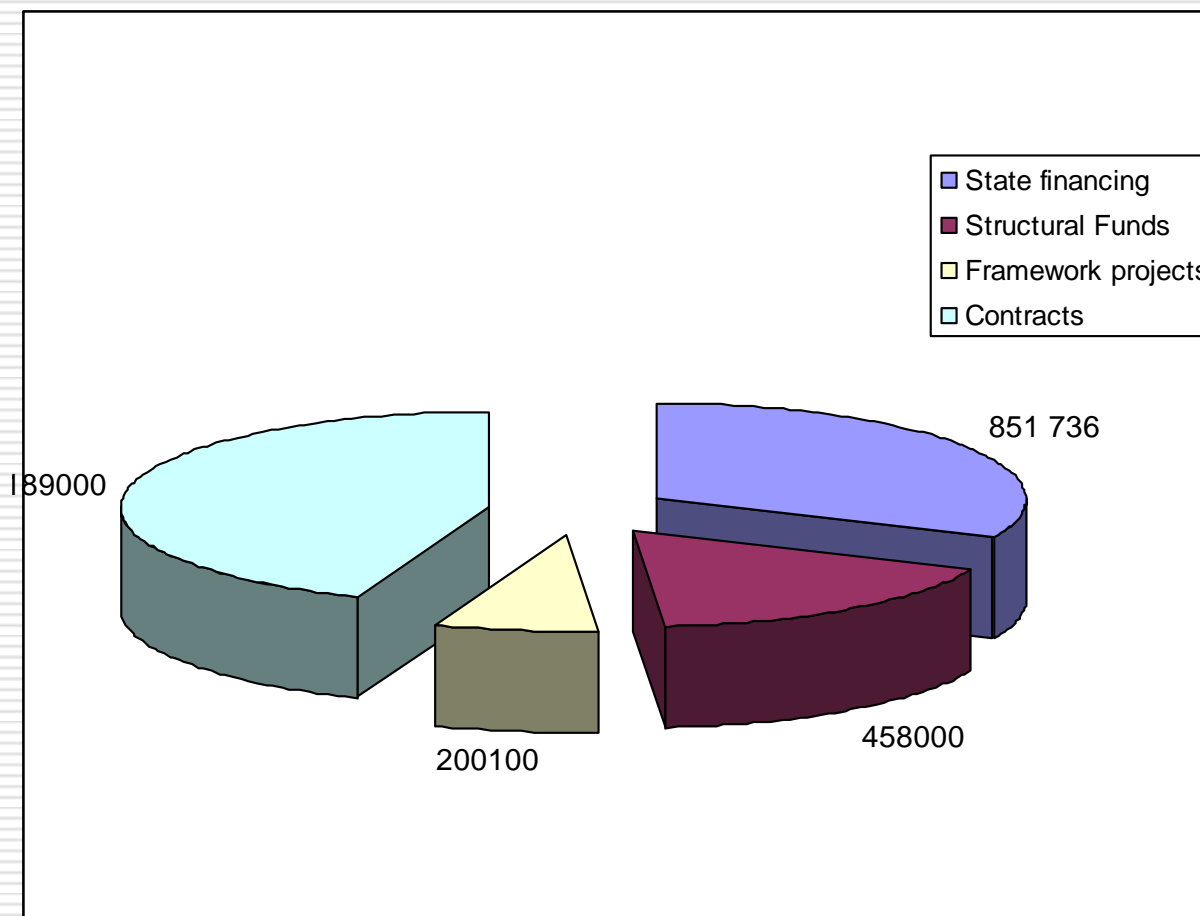- Economics
- Others 4 different

32, 23, 4, 2, 4, 2, 2
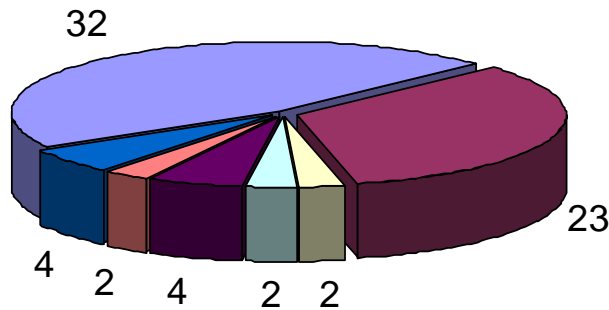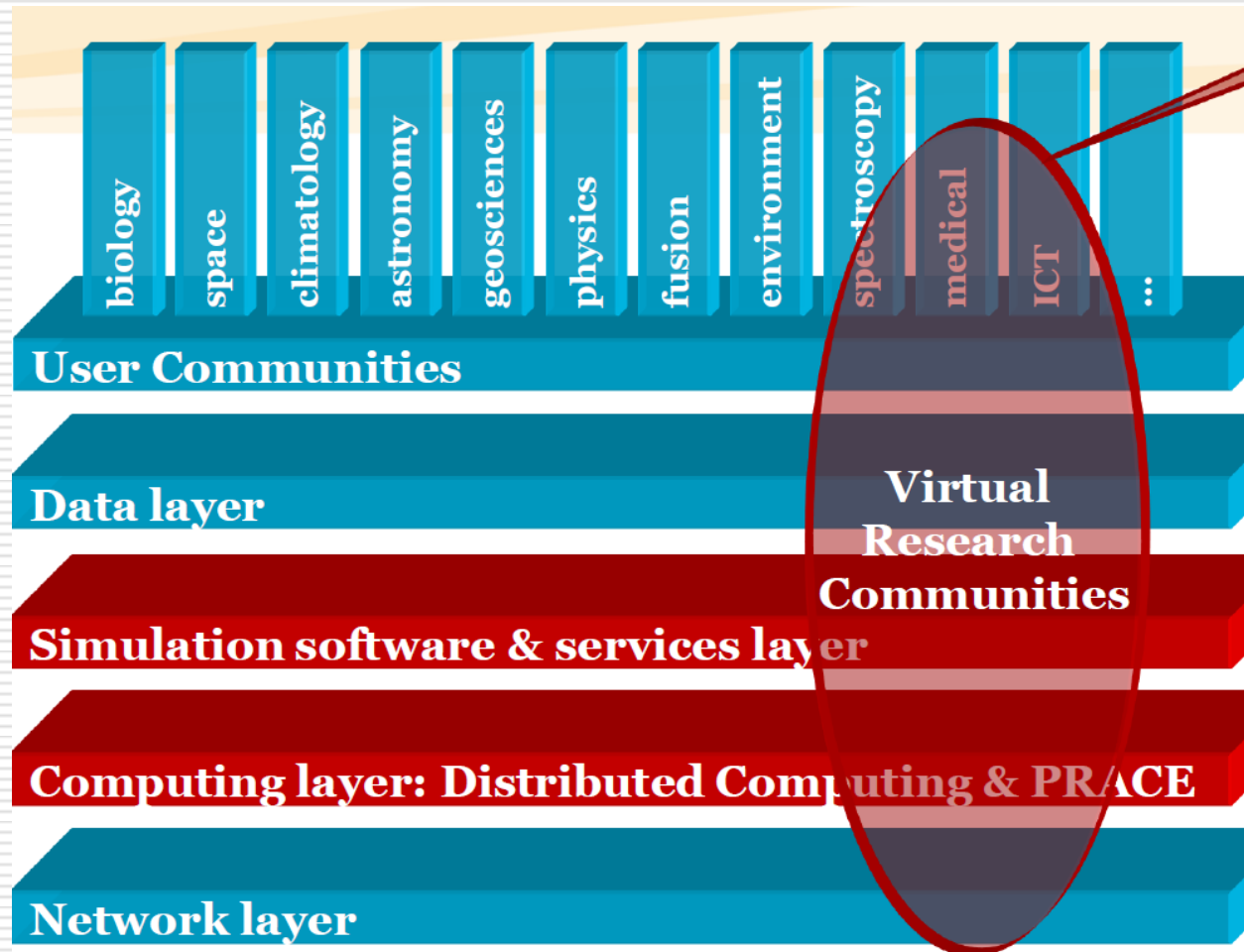
Number of masters (57)

Legend:
- Mathematics
- Computer Science
- Philology
- Art
- Law
- Others 9 different

3, 12, 31, 2, 2, 7

Public institutions financing sources in 2011

Different layers of e-infrastructure are available today to support scientific research: GÉANT network, GRID technologies and scientific field-specific e-infrastructures (ESFRI).

ESFRI Roadmap 2010

48 new - or major upgrade of - Research Infrastructures of pan-European interest

(+ 3 additional projects from the CERN Council strategic roadmap for particle physics*)

Social Sc. & Hum. (5)	Life Sciences (13)		Environmental Sciences (9)		Energy (7)	Material and Analytical Facilities (6)	Physics and Astronomy (10)		e-Infra-structures (1)
SHARE	BBMRI	ELIXIR	ICOS	EURO-ARGO	ECCSEL	EUROFEL	ELI	TIARA*	PRACE
European Social Survey	ECRIN	INFRA FRONTIER	LIFEWATCH	IAGOS	WindScanner	EMFL	SPIRAL2	CTA	
CESSDA	INSTRUCT	EATRIS	EMSO	EPOS	EU-SOLARIS	European XFEL	E-ELT	SKA	
CLARIN	EU-OPENSCREEN	EMBRC	SIAEOS	EISCAT_3D	JHR	ESRF Upgrade	KM3NeT	FAIR	
DARIAH	Euro BioImaging	ERINHA BSL4 Lab		COPAL	IFMIF	NEUTRON ESS	SLHC-PP*	ILC-HIGRADE*	
	ISBE	MIRRI			HiPER	ILL20/20 Upgrade			
	ANAEE				MYRRHA				

Distributed research infrastructures

Single sited research infrastructures

IMCS UL support national node

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ECSS 2011 Milan

Today for researchers in Latvia IMCS provides:

Networking and international connectivity to GÉANT
(IMCS is partner of GN3- http://www.geant.net),

► computing environment (GRID computing environment and National Grid Infrastructure http://www.egi.eu and
-EGI-InSPIRE http://www.egi.eu/projects/egi-inspire/,

► national Cloud prototype with servers (IBM series 3500) and IBM Storage Area Network of ½ Peta Byte capacity); This year IMCS has started project on upgrading Cloud Computing facilities with 1.5 Peta Byte data storage and High Performance Computing (HPC) (~ 40 Tera Flops).

► eScience functional application of e-infrastructure:
CLARIN-http://www.clarin.eu,
ELIXIR- http://www.elixir-europe.org ,
radio astronomy data streaming facility from Irbene radiotelescope,

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Positiv impact of international collaboration on development of e-infrastructure

IMCS participations in international organizations:

► Data networking organizations
  DANTE, TERENA, Future Internet Forum, CEENet, EGI, Nordunet, CENTR,
  RIPE NCC, ICANN, CERT, Trusted Introducer, FIRST;
► Science infrastructure for languages
  CLARIN, META-NET, Nordic Graduate School of Language Technology;
► Bioinformatics science infrastructure
  ELIXIR,
► Other international organizations
  International Mathematical Union, ARTEMISIA, ECMI, OMG,
  Association Informatics Europe;

Most important international research projects are:
  CLARIN, EGI-InSPIRE, ENGAGE, CAGEKID, OSIRIS, Geant,
  BALTICGRID, R3-COP (ARTEMIS), ReDSeeDS, MolPAGE.

Success rates in FP projects for EU countries

In FP7 Latvia has submitted 740 project proposals: 162 proposals retained; 14
contracts are concluded at the moment Source: ECORDA-Database, March 201

	FP5 1999-2002	FP6 2002-2006	FP7 2007-2013
Participation in project proposal consortiums (number of participants)	640 (776)	1027 (1206)	530 (650)
Concluded agreements (agreements being concluded) on performance of project tasks	195	217	124 (89)
Number of participants in concluded agreements (agreements to be concluded)	232	241	157
Pass-rate	30,0%	21%	23%
Amount of funding (EUR) under agreements on performance of project tasks	14,6 mil.	21,6 mil.	11,5 mil.

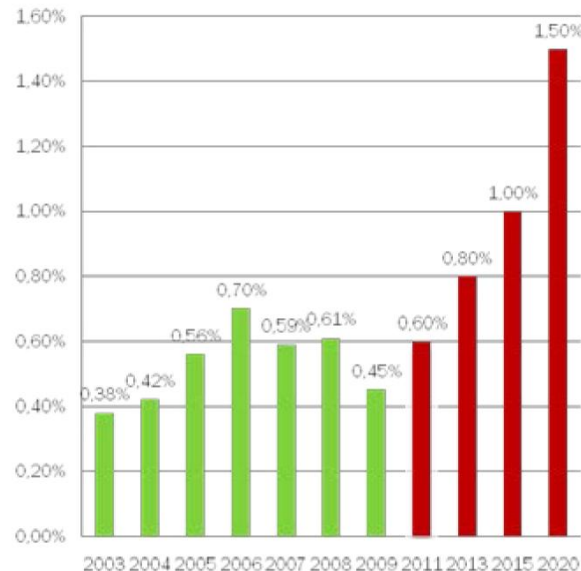Latvia's participation indicators in EU Framework Programmes

Research policy

R&D INVESTMENT IN LATVIA

- **1,0%** of GDP by **2015:** 0,45% should be financed by the public sector and 0,55% by the private sector.

- **1,5%** of GDP by **2020:** 0,60% should be financed by the public sector and 0,90% by the private sector.

- **EU–27:**
  2009: 2,01% from GDP
  2020: 3% from GDP

R&D Expenditure as % of GDP (2011 - 2020 expected)

1.60% 1.40% 1.20% 1.00% 0.80% 0.60% 0.40% 0.20% 0.00%

0.38% 0.42% 0.56% 0.70% 0.59% 0.61% 0.45% 0.60% 0.80% 1.00% 1.50%

2003 2004 2005 2006 2007 2008 2009 2011 2013 2015 2020

Latvia has one of the lowest science funding levels among EU member states. E- infrastructure in Latvia was developed seperately by institutions providing services on the basis of contracts

Latvian research infrastructure development is based on structural funds

Problems:

A. Permitted uses of funding for research infrastructure is limited: The funding can be used only for equipment purchases and services Therefore it stimulates e-infrastructure outsourcing

A. National programs in the previous planning period did not encompass concept of shared infrastructure. In the current planning period small-scale structural fund project for development of infrastructure is available however still there is no requirement of shared IT infrastructure

C. Compliance with the state aid requirements is especially onerous. In practice this non-conformity generates heavy bureaucracy.

Discussion about outsourcing in development of research e-infrastructure

Usage of structural funds stimulate outsourcing
Terena has opened the discussion:
► Which services could or should NREN provide to the R&D community before this community turns to other providers with the risk of weakening the NREN's business case;
► Is Cloud Computing a strategic domain in which NRENs should invest;
► Is there a need in obtaining a pan-European community cloud infrastructure.
► Are Email services, collaborative platforms, e-learning services, to be considered as strategic for NREN.

Arguments that are against the outsourcing of services:
► outsourcing costs too much. Isn't it cheaper to do it in-house?
► today's technologies, I don't need to outsource.
► I don't want to lose control of the core business.
► I can't measure the success of our initiatives if a third party carries them out.

Relevant question is competition

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E-infrastructure development faces competition at a global, multi-country, regional and institutional level in the environment of growing globalization.

► Strategic choice between development of national Cloud Computing and High Performance Computing centers or usage of pan-European community cloud infrastructure raises the question of global competition.

► Competition at institutional level. Institutes has developed their own IT resources. Usage of centralized research e-infrastructure services in point of view of research institutions is outsourcing.

For IMCS the development of researh e-infrastructure is its core business and must be kept in-house. But the definition of core services is obviously different in case of university IT departments, research institutes, and NRENs. Besides circumstances change and basic tenets from time to time should be revised: if the function is technical and innovative activity is no longer visible, it should be handed over to commercial enterprises.

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Last important factor in development of e-infrastructure - public private partnership (PPP)

Today's task is to strengthen research institution cooperation with the industry. If there is not enough public funding for R&D development mechanisms of attracting private investments should be analyzed. Possible examples of PPP:

1. Regional Cloud Exchange idea for integrated use of regional cloud computing facilities

2. PPP for development of whole R&D e-infrastructure

RIGA   ---------   Thanks for attention! ---------   MILAN
IMCS UL