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PANEL P : PHYSICAL SCIENCES

Panel P: Physical Sciences

- *To provide the Lithuanian public, policy-makers and decision-makers and the academic community with the most objective picture possible of the excellence and competitiveness of Lithuanian science **in comparison with the global practice** in the respective area of science.*

Criteria

- research quality, economic and social impact, infrastructure, research management and development potential
- self-assessment report:
 - Human resources
 - Research output
 - Doctoral training
 - National and international collaboration
 - Other scientific and social activities
 - SWOT analysis
 - Funding

Topics and Places

- Environmental Engineering, Mathematics, Physics, Chemistry, Biochemistry, Biology, Geology, Geography, Astronomy, Informatics, Ecology and Environmental
- **Universities**
 - Kaunas University of Technology
 - Lithuanian University of Educational Sciences
 - Vytautas Magnus University
 - Šiauliai University
 - Vilnius University
- **Research Institutes**
 - Center for Physical Sciences and Technology
 - Nature Research Centre

Process

- assessments were based on both the self-assessment reports and evidence gathered during site visits
- at least two Panel members were present at each visit
- each self-assessment report was read in detail by at least two Panel members and then discussed by the whole Panel on at least two occasions

General Findings

- very diverse range of activities
- complicated assessment in comparison to single subject assessment
- great variation in the research
- overall score for the Unit

General Findings

- the number of Units too large and cooperation between Units not as good as it should be
- reducing duplication and/or merging as much as possible in order to focus the national research effort
- the structure within Units should be as flexible as possible

Overall Ratings

- 5 Units were operating at the grade 4 level indicating strong international players
- 9 Units were operating at the grade 3 level indicating strong national players with some international recognition
- 5 Units were assessed at the grade 2 level indicating satisfactory national players

Merger possibilities

- The Faculty of Mathematics and Informatics (VU) and the Institute of Mathematics and Informatics (VU)
- The Institute of Geology and Geography (Nature Research Center) and the Geo Faculty of Natural Sciences (VU)
- The Institute of Biotechnology (VU) [lead] and Institute of Biochemistry (VU)
- The Faculty of Chemistry (VU) [lead] and the Institute of Chemistry (Center for Physical Sciences and Technology)

University/External Funding

- the core government funding has been erratic and is insufficient to fund university research activities at the international level
- all Units should become more involved at the European level and aim to be part of EU programmes such as Horizon 2020.

Bureaucracy

- The Panel recommend that Lithuanian bureaucracy, particularly for procurement, is made as simple and flexible as possible

PhD students

- The Panel were impressed by the PhD students who they talked with across the Units and also with the level of supervision
- The Panel recommend that the level of PhD scholarship should be increased to a level that enables students to concentrate on their PhD studies alone
- This, in turn, should reduce the time to complete a PhD in Lithuania which at the present time is too long

Postdoctoral Fellows

- The Panel was surprised by the few number of Postdoctoral Fellows they met during their visits
- The Panel recommend that the Postdoctoral Fellows Programme is aggressively promoted in particular to facilitate inward visits from the international research community

Age distribution

- there is an age distribution problem in some Units; the majority of the managers/researchers are in the upper age bracket
- ensure that career promotion and research management processes are made available to all staff and that a policy of management rotation be developed

Working Language

- The use of the Lithuanian language is perceived as an impediment to attracting non Lithuanians to study or research in the country
- The Panel found many cases where the working language within Units/laboratories was Lithuanian and where many, if not, all signs were in Lithuanian
- The Panel recommend that all students should be required to do all their work in English; course work, written work laboratory notebooks and project work

International Involvement

- the Panel identified two areas of concerns, namely, a lack of ambition among the staff and a lack of leadership
- many researchers had made substantial contributions within their research field but the Panel found little evidence that they had initiated research projects
- the Panel recommend that incentives/support should be introduced for researchers which reward ambitious and more proactive activity in promoting their research through international channels

Equipment

- in general the Panel found state of the art equipment available in many Units most of which resulted from the establishment of the 'Valleys' initiative
- there is a requirement that the equipment is exploited to its best potential that sufficient technical support staff and recurring costs are made available

Technology Transfer

- The Panel found many good examples of technology transfer and applied research
- The Panel recommend that researchers in this area should be assessed and promoted on the impact of their research rather than the normal publication criteria

Summary,

- there is a good PhD student base which needs to be expanded to consolidate the future of Lithuania international research
- there is a substantial base of modern equipment in the country but there is a need to ensure continual maintenance and support
- there are many instances of international research being performed but it is not being exploited and promoted internationally
- as many courses as possible should be lectured in English as this will help attract more foreign students and staff

National Research Funding

- The Panel recommends that all public research and development funding in Lithuania is allocated using assessment by international panels of experts

Institutional Assessments

- Optoelectronics and Laser technologies at the Center for Physical Sciences and Technology
- majority of the Units were assessed at the grade 3 level
- none at Grade 1
- research environment and infrastructure in Lithuania are in good

Institutional Assessments

- many cases were the research management could be improved and that a clear strategy and objectives were needed
- early career development policies and promotion criteria are needed

Mathematics

- in general the emphasis is on basic research
- universities with a department and a separate institute seem to be over organized and more flexibility is needed
- 2 – 3 groups have achieved excellent internationally recognized results
- Navier-Stokes equations and number theory is on a good level in several universities

Informatics

- two Units which have Informatics combined with Mathematics
- research portfolio is not well focussed
- computing technology is now a dominate contributor to most economies and to society as well as contributing strongly to research in other subjects
- there are the foundations for such a development

Physics

- strong fields are optics and lasers, nanotechnology and semiconductors
- among the 5 Units with a grade of 4, 4 are dealing with Physics
- a good balance between basic and applied research

Chemistry

- generally good at the national level with a good number of internationally competitive researchers at several institutions
- management issues, partially unfavourable age distribution and lower morale of older staff, and low numbers of post-doctoral fellows and graduate students
- analytical instrument base is excellent shape

Biochemistry

- significant applied research output has been generated and there is a strong track record in translational research
- good number of promising younger academics, excellent calibre of the Ph.D. students, excellent instrumentation and good infrastructure
- offers significant potential for the future

Geology

- overall activity of the Units[Vilnius University and Nature Center] is somewhat diverse and needs to be coordinated and better managed
- none of the Units is well equipped to proceed with international quality research
- age distribution does not support sustainable development of both Units separately
- renovation of instrumentation and equipment is urgently needed

Physical Geography

- geographical sciences are even more fragmented than geological sciences
- duplication on research and also in using human resources
- none of these sub-units have high international visibility, all sub-units are small in terms of financing and number of PhDs
- better coordination and management is vital to ensure sustainability and internationally visible research output

Astronomy

- research is at the top Baltic level, but with more ambitious goals could better compete internationally



OUR EVIDENCE – YOUR DECISIONS

