

**P. J. ŠAFÁRIK UNIVERSITY
FACULTY OF SCIENCE
KOŠICE, SLOVAKIA**



ANNUAL REPORT 2009



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INTRODUCTION

Faculty of Science of P. J. Šafárik University in Košice was founded in 1963 and since that time it has educated more than 5 000 graduates of both, single and joint degree programme studies in all branches of natural sciences. Within the European Union adopted model 3-5-8, the Faculty provides the Bachelor's and Magister's degree studies in the following branches: Biology, Chemistry, Environmental Ecology, Geography, Informatics, Mathematics and Physics as well as all joint degree programmes in combinations of Biology, Chemistry, Geography, Informatics, Mathematics and Physics. Since 2006, in cooperation with Faculty of Arts joint degree programmes in combinations with Psychology, Philosophy, Slovak language and British and American studies were opened.

As a respected research institution, the Faculty offers also PhD study programmes in sixteen accredited fields of science for graduates from Slovak and foreign universities. The education at the Faculty of Science is provided by experienced teachers who carry out also research and closely co-operate with Slovak and foreign universities and research facilities.

The research at the Faculty of Science at Šafárik University in Košice shows multidisciplinary character and due to this it covers a wide range of topics from molecular biology to computer and material sciences. The research in 2009 in the field of Biology and Ecology was directed towards the problems of biodiversity of plants and animals, biotechnology of medicinal plants, carcinogenesis, prevention and cancer therapy; in Geography the research was aimed at hydrology of the Slovak karst. Research in Chemistry focused on synthesis and properties of new compounds with biological activity, new materials and new analytical methods. Research in Informatics was concentrated on fuzzy techniques, neural networks, logical programming and preparation of web-university, in Mathematics it followed the ideas of graph theory, algebraic structures, differential equations and topology and in Physics it was concentrated on development of new magnetic materials, theoretical and experimental research of low-dimensional magnetism and quantum liquids at ultra-low temperatures, nuclear collision studies and photodynamic effect. The research was also carried out in the fields of theory of teaching of biology, chemistry, informatics, mathematics and physics. High percentage of the scientific outputs is done in the co-operation with foreign universities or research facilities.

Graduates of the Faculty find positions not only as researchers and secondary school teachers but they can successfully work in the business sphere and public administration. Some of them successfully undertake doctoral study or postdoctoral training abroad to be well accepted in the European labour market. New forms of further long-life education as a part of service done to society are provided for graduates of the Faculty of Science as well as for the public. The RNDr. (Rerum Naturalium Doctor) examinations, qualification examinations, various courses and training projects are to be mentioned. In accordance with European documents on higher education the Faculty uses the credit-based system in line with the European standard ECTS. Joining the European ERASMUS programme promoted the possibility for our students to undertake a fully recognized period of study at EU universities as an integral part of their degree and academic qualification as well as allowed to the students from EU countries to undertake a semester or two of studies at our faculty.

ACADEMIC OFFICIALS

Dean: *Prof. Pavol Sovák, PhD.*



Vice - deans: *Prof. Andrej Bobák, DSc.*
(international affairs, research and doctoral study)
Assoc. Prof. Katarína Kimáková, PhD.
(academic affairs and further education)
Assoc. Prof. Dušan Šveda, PhD.
(development of faculty and lifelong education)

Chairman of Academic Senate : *Marcel Török, PhD.*

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P. J. Šafárik University
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Slovak Republic

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http://www.science.upjs.sk

SCIENTIFIC BOARD

Chairman:

Prof. Pavol Sovák, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Physics)

Vice-chairman:

Prof. Andrej Bobák, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Physics)

Members:

Assoc. Prof. Gabriela Andrejková, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Informatics)

Prof. Marian Antalík, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Chemistry)

Prof. Yaroslav Bazel', DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Chemistry)

Prof. Anton Bezák, DSc.

(Comenius University, Faculty of Natural Sciences, Bratislava)

Assoc. Prof. Ing. Albert Breier, DSc.

(Slovak Academy of Sciences, Institute of Molecular Physiology and Genetics, Bratislava)

Prof. Katarína Cechlárová, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Mathematics)

Prof. Eva Čellárová, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Biology and Ecology)

Prof. Juraj Černák, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Chemistry)

Prof. Jozef Doboš, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Mathematics)

Prof. Peter Fedoročko, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Biology and Ecology)

Prof. Alexander Feher, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Physics)

Assoc.Prof. Karol Flachbart, DSc.

(Slovak Academy of Sciences, Institute of Experimental Physics, Košice)

Prof. Viliam Geffert, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Informatics)

Prof. Jozef Gonda, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Chemistry)

Assoc. Prof. Zdenko Hochmuth, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Geography)

Assoc. Prof. Ján Imrich, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Chemistry)

Assoc. Prof. Michal Jaščur, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Physics)

Prof. Stanislav Jendroľ, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Mathematics)

Assoc. Prof. Katarína Kimáková, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Biology and Ecology)

Prof. Pavol Miškovský, DSc.

(P. J. Šafárik University, Faculty of Science, Institute of Physics)

M.Sc. Jozef Ondáš, PhD.

(T-SYSTEMS SLOVAKIA, s. r. o. Košice)

Assoc. Prof. Olga Orosová, PhD.

(P. J. Šafárik University, Faculty of Arts)

Prof. Igor Podlubný, PhD.

(Technical University, Faculty of Mining, Ecology and Geotechnology, Košice)

Prof. Pavol Raschman, PhD.

(Technical University, Faculty of Metallurgy, Košice)

Assoc. Prof. Gabriel Semanišin, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Informatics)

Assoc. Prof. Peter Spišiak, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Geography)

Prof. Beňadik Šmajda, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Biology and Ecology)

Assoc. Prof. Dušan Šveda, PhD.

(P. J. Šafárik University, Faculty of Science, Institute of Mathematics)

MVDr. Ivo Vanický, PhD.

(Slovak Academy of Sciences, Institute of Neurobiology, Košice)

Prof. Štefan Vilček, DSc.

(University of Veterinary Medicine, Košice)

STRUCTURE OF FACULTY

The administrative structure of the Faculty of Science is based on larger institutes incorporating individual departments. The head of each institute is Director (Professor or Associated Professor) and the Council of the Institute formed of full-time Professors and Heads of departments. This structure enables better organization of the pedagogical and scientific life of the Faculty.

Within the Faculty are active also the Centre of Applied Computer Science (developing the Academic Information System) and the Centre for Lifelong Learning organizing other forms of educational activities and European projects are included within the structure of the Faculty.

The actual detailed structure of the Faculty is given below and the next table displays the number of professors, lectures and assistants as well as researchers at the Institutes.

INSTITUTE of BIOLOGY and ECOLOGY

Department of Animal Physiology

Department of Botany

Department of Cell Biology

Department of Genetics

Department of Zoology

Division of Didactics of Biology

Laboratory of Molecular-Biological Diagnostics

INSTITUTE of CHEMISTRY

Department of Analytical Chemistry

Department of Biochemistry

Department of Inorganic Chemistry

Department of Organic Chemistry

Department of Physical Chemistry

Division of Didactics of Chemistry

Nuclear Magnetic Resonance Laboratory

INSTITUTE of GEOGRAPHY

INSTITUTE of INFORMATICS

INSTITUTE of MATHEMATICS

Division of Algebra and Geometry

Division of Didactics of Mathematics

Division of Discrete Mathematics

Division of Economical and Financial Mathematics

Division of Mathematical Analysis

INSTITUTE of PHYSICS

Department of Biophysics

Department of Physics of Condensed Matter

Department of Nuclear and Subnuclear Physics

Department of Theoretical Physics and Astrophysics

Division of Didactics of Physics

Technology Transfer Laboratory

OTHER UNITS

Centre of Applied Computer Science

Centre for Lifelong Learning

INSTITUTES

	Biology and Ecology	Chemistry	Geography	Infor matics	Mathe matics	Physics	Total
<i>Professors</i>	5	5	0	1	4	6	21
<i>Associated Professors</i>	11	15	2	5	12	9	54
<i>Assistant Professors</i>	13	7	3	7	10	9	49
<i>Researchers</i>	11	11	2	1	1	19	45

EDUCATION

In Slovakia, the Faculty was one of the pioneers in implementation of credit-based system of study that was developed with help of EC projects and supported by a self-made information system. To provide access to higher education for a larger number of applicants, 480 full-time undergraduate students were admitted to the Faculty in 2009. At present, there are more than 1250 bachelor and master studies students at the Faculty.

The following teaching programmes are offered to them:

- **Single (one-subject) programmes – bachelor degree**

Biology

Chemistry

General Ecology and Ecology of Individuals and Populations

Informatics

Landscape structures and its transformation

Mathematics

Physics

- **Single (one-subject) programmes – magister degree**

Genetics and Molecular Cytology

Botany and Plant Physiology

Zoology and Animal Physiology

Chemistry with specialization in

Physical Chemistry

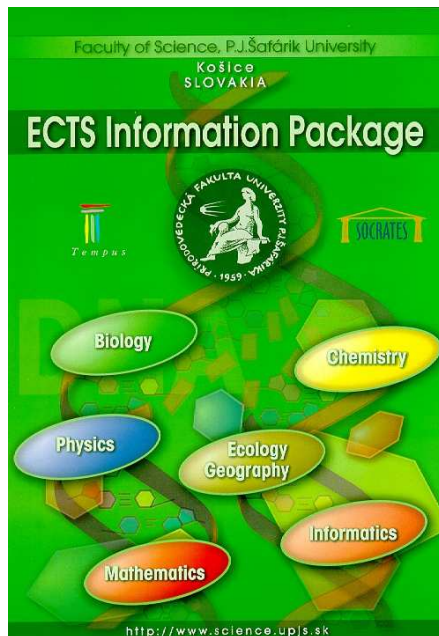
Bioinorganic chemistry

Bioorganic Chemistry

Biochemistry

Inorganic Chemistry

Analytical Chemistry



Organic Chemistry

General Ecology and Ecology of Individuals and Populations

Geography

Informatics

Mathematics

Economic and Financial Mathematics

Managerial Mathematics

Physics with specialization in

Astronomy and Astrophysics

Computer Physics

General Physics and Mathematical Physics

Biophysics

Nuclear and Subnuclear Physics

Physics of Condensed Matter

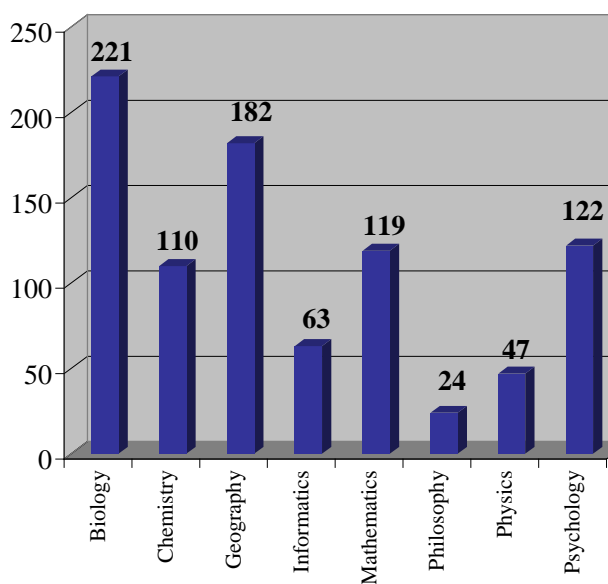
- **Joint (two-subject) programmes (bachelor and magister degree) and programmes for teachers-training (magister degree) combination of following subjects:**

Biology, Chemistry, Geography, Informatics, Mathematics, Physics, Philosophy,

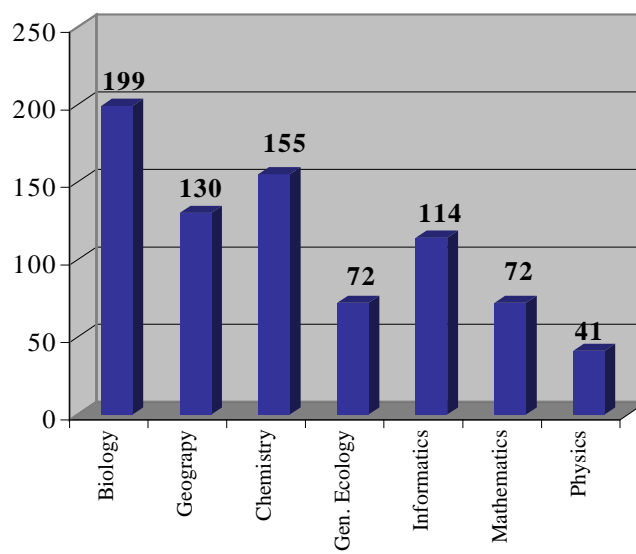
Psychology

Distribution of undergraduate students

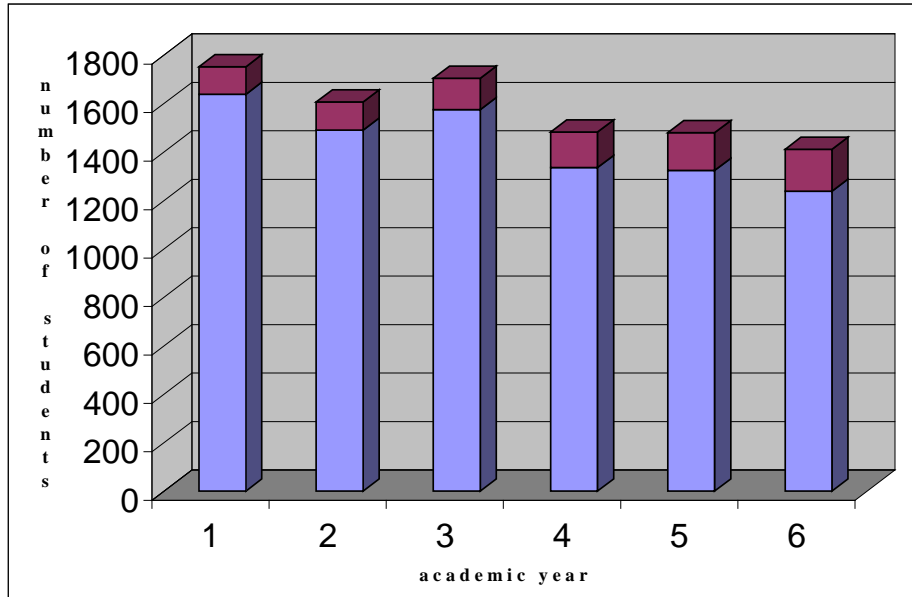
Number of students - Joint (two-subject)



Number of students - Single (one-subject)



Number of students



undergraduate students



postgraduate students

1	2004/05
2	2005/06
3	2006/07
4	2007/08
5	2008/09
6	2009/10

DOCTORAL STUDY

To complete the full-range education in all disciplines taught, the Faculty offers PhD study in fifteen branches:

Analytical Chemistry

Animal Physiology

Applied Mathematics

Biochemistry

Biophysics

Condensed Matter Physics and Acoustic

Discrete Mathematics

General Physics and Mathematical Physics

Genetics

Inorganic Chemistry

Molecular Cytology

Nuclear and Sub-nuclear Physics

Organic Chemistry

Informatics

Theory of Teaching of Mathematics

Theory of Teaching of Physics

Number of PhD students in the last year reached approximately 130 students in internal form and about 30 students in external form of PhD study. Doctoral students are supervised by individuals from Faculty and Slovak Academy of Sciences with high national and international reputations in their research field and receive an excellent research training as a result. Scientific contributions of doctoral students represent a permanently increasing portion of scientific outputs at the Faculty. In 2009, 27 doctoral theses were defended. Doctoral students participate in research activities as well as in teaching.

DOCTORAL THESES DEFENDED IN 2009

1. **RNDr. Erik Bruoth** – Discrete mathematics
„On-line colouring of graphs“
2. **RNDr. Helena Myšková** – Discrete mathematics
„Solvability of systems and interval systems of linear equations over the max-plus and max-min algebra“
3. **Mgr. Zuzana Tomášková** – Biophysics
„Study of permeation properties of intracellular Ca^{2+} channels isolated from the rat heart“
4. **RNDr. Andrea Baur** – Organic Chemistry
„Stereoselective synthesis of the 5'-aminofuranoside part of polyoxins via (3,3)-sigmatropic rearrangements“
5. **RNDr. Jana Tomaščíková** – Organic Chemistry
„Complex study of properties of selected thiosemicarbazides and their products in heterocyclic reactions“
6. **RNDr. Peter Orendáš** – Animal Physiology
„Coxibs role in the prevention of experimental mammary carcinogenesis in female rats“
7. **RNDr. Zuzana Katkovčínová** – Genetics
„Taxane production and expression of *dbat* and *dbtbn1* genes in *Taxus baccata* L. in vitro cell cultures“
8. **RNDr. Zuzana Gibová** – Theory of Teaching of Physics
„Creation complex didactic educational material for teaching physics at technical universities“
9. **RNDr. František Galčík** – Informatics
„Communication in Radio Networks“
10. **RNDr. Zdenka Bedlovičová** – Organic Chemistry
„The influence of azomethine chromophore on physico-chemical properties of conjugate systems possessing acridine pharmacophores“
11. **RNDr. Jana Zlámalová** – Discrete mathematics
„Chromatic characteristics of graphs embedded to surfaces“
12. **RNDr. Erika Škrabuřáková** – Discrete mathematics
„Edge colourings of plane graphs“
13. **RNDr. Jana Pócssová** – Theory of Teaching of Mathematics
„Developing creativity in teaching of mathematics (with emphasis on teaching statistics)“

- 14. RNDr. Marián Buxár** – *Theory of Teaching of Mathematics*
„How to create and use teaching software in teaching mathematics (Author system Toolbook used for preparation of teaching materials“
- 15. RNDr. Anton Baran** – *Condensed Matter Physics and Acoustic*
„Magnetism and nonconventional electronic states in cobaltates and ruthenates“
- 16. Ing. Vlasta Závřšová** – *Condensed Matter Physics and Acoustic*
„The study of physical systems containing fine magnetic particles“
- 17. RNDr. Marcel Človečko** – *Condensed Matter Physics and Acoustic*
„The Nonlinear Phenomena in Superfluid Phases of ^3He “
- 18. RNDr. Jana Kolodziejová** – *Informatics*
„Ontology Engineering Relationally“
- 19. RNDr. Juraj Ševc** – *Animal Physiology*
„Proliferation and transformation of neuroepithelium and ependyma in the spinal cord of rat during development“
- 20. RNDr. Alexandra Bukovská** – *Biochemistry*
„Real-time PCR quantification of specific mRNAs: expression of cytokines during inflammation and early embryonal development in mouse“
- 21. RNDr. Viera Borbel'ová** – *Discrete mathematics*
„Algorithms for matching and exchange problems“
- 22. RNDr. Emília Draženská** – *Discrete mathematics*
„The crossing numbers of Cartesian products of graphs“
- 23. RNDr. Jana Hnatová** – *Theory of Teaching of Mathematics*
„Preparation of matura problems in mathematics“
- 24. RNDr. Eva Kostíková** – *Theory of Teaching of Mathematics*
„Oscillatoric properties of neutral differential equations in the context of mathematics teaching at universities“
- 25. RNDr. Aneta Salayová** – *Organic chemistry*
„Synthesis of amino analogs of 1-methoxyspiroindoline phytoalexins“
- 26. RNDr. Monika Tvrdoňová** – *Organic chemistry*
„Synthesis of novel nucleoside C-2' and C-3 isothiocyanates via thermal and microwave induced aza-Claisen rearrang“
- 27. RNDr. Jana Turčanová** – *Condensed Matter Physics and Acoustic*
„Magnetic properties of selected nanocrystalline soft magnetic alloys based on iron, nickel and cobalt“

RESEARCH HIGHLIGHTS

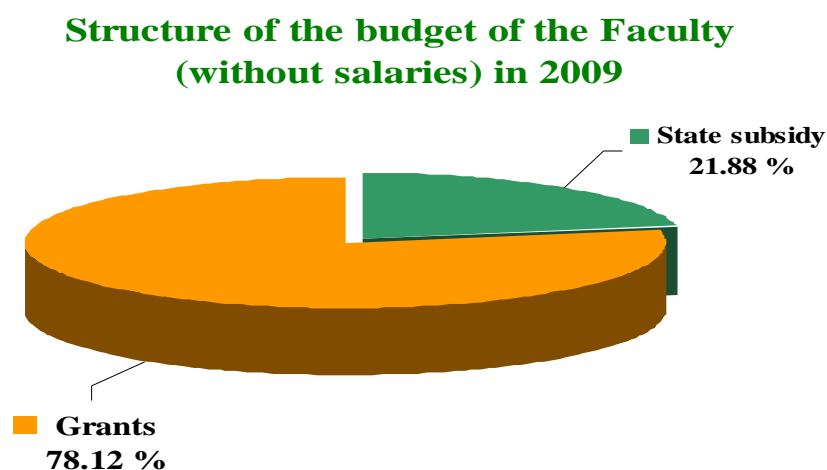
Faculty of Science of P. J. Šafárik University in Košice is included in the group of research faculties, which put strong accent on research as an integral part of their mission. Multidisciplinary character of the Faculty is a good prerequisite for interdisciplinary approach and integration of scientific activities. After entering into European structures the priorities of the Faculty are integration into European research area, improving the quality of scientific outputs and PhD study, increasing the stream of financial sources for scientific activities, rebuilding of research and information infrastructure of the Faculty and extension of services in community, business, research, developmental, industrial and agricultural facilities in Slovakia.

In 2009, the Faculty has continued to improve the quality of several excellent research laboratories: Laboratory of NMR spectroscopy, Laboratory of spectral methods, Laboratory of thermal analysis and Laboratory of structure analysis of biomacromolecules (Institute of Chemistry), Laboratory of flow cytometry and Laboratory of cell cultures (Institute of Biology), Laboratory of low temperature physics with new helium liquefier and MPMS SQUID as well as PPMS apparatuses, Laboratory of biophotonics and Laboratory of advanced computer technologies (Institute of Physics) as well as the Laboratory of GIS (Institute of Geography).

In these and other laboratories worked more than 220 university teachers and researchers together with about 100 doctoral students. This staff is involved in up to 170 scientific projects supported by both, grants for fundamental research from the Slovak grant agencies: Slovak Grant Agency for Science (VEGA), Slovak Agency for Science and Technology (APVV), Slovak Cultural and Educational Agency (KEGA), and foreign sources of funding such as EU FP6 projects and DAAD (Germany) and other institutions. Moreover, young researchers were supported by internal grant systems (VVGS) at the university as well as faculty level. In 2009, the University and Faculty supported 15 and 24 VVGS projects, respectively.

Excellence in research measured by international standards is a first objective of our research teams. Within the Faculty, a Centre of excellence for low-temperature physics exists. In applied research, the main attention is paid to pharmaceutical, pharmacological, chemical and material research. Continuous increase in funding sources for research is caused by the

growing activity and comes from research grants and contracts. It exceeds the average grant income of the Slovak universities, year after year it becomes more and more important part of the budget of the Faculty (in 2009 grants made up 78,18 % of the overall budget, see the graph).

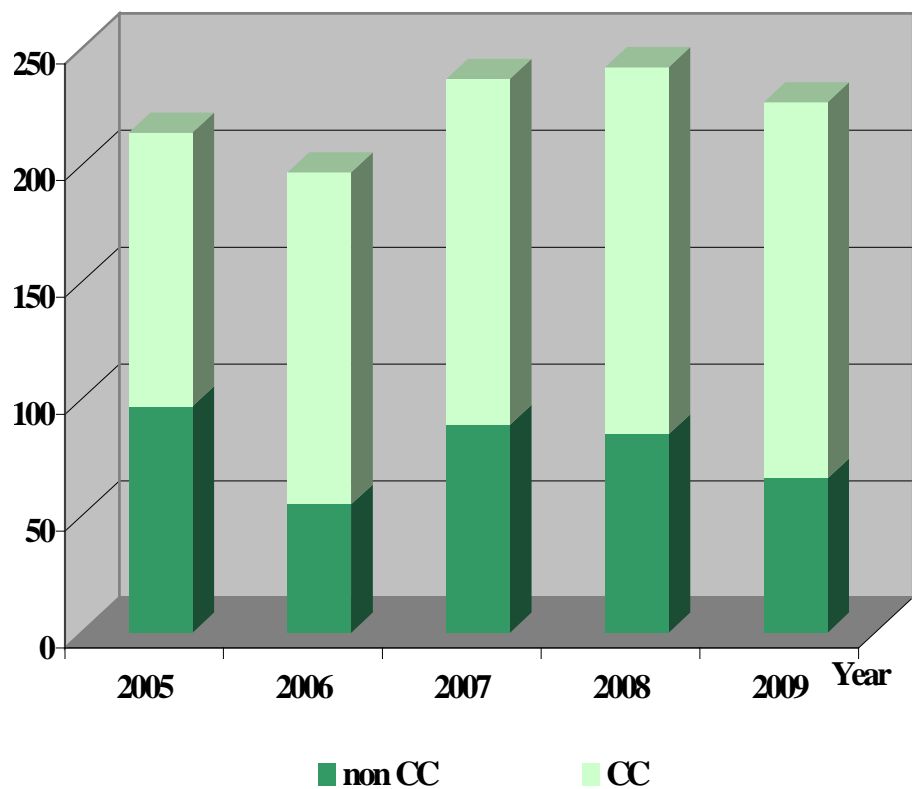


The unique opportunity for the establishment of the peak research infrastructure is the utilisation of the EU structural funds within the operational programme „Science and Research“. In co-operation with the Institutes of P. J. Šafárik University in Košice, Institutes of Slovak Academy of Sciences and other Universities, the Faculty participates in realisation of 5 Centres of Excellence. During the implementation of these projects the building reconstruction of the Institutes has started, tenders for the purchase of technical infrastructure are realised and the Faculty received the first valuable experimental equipments. The first period of the projects will culminate in 2010 along with the start of the second period lasting until 2012. Globally, 2,8 mil. € for the first period and 3,7 mil. € for the second period is bounded by the contract for the support of Institutes in the premises of the Faculty.

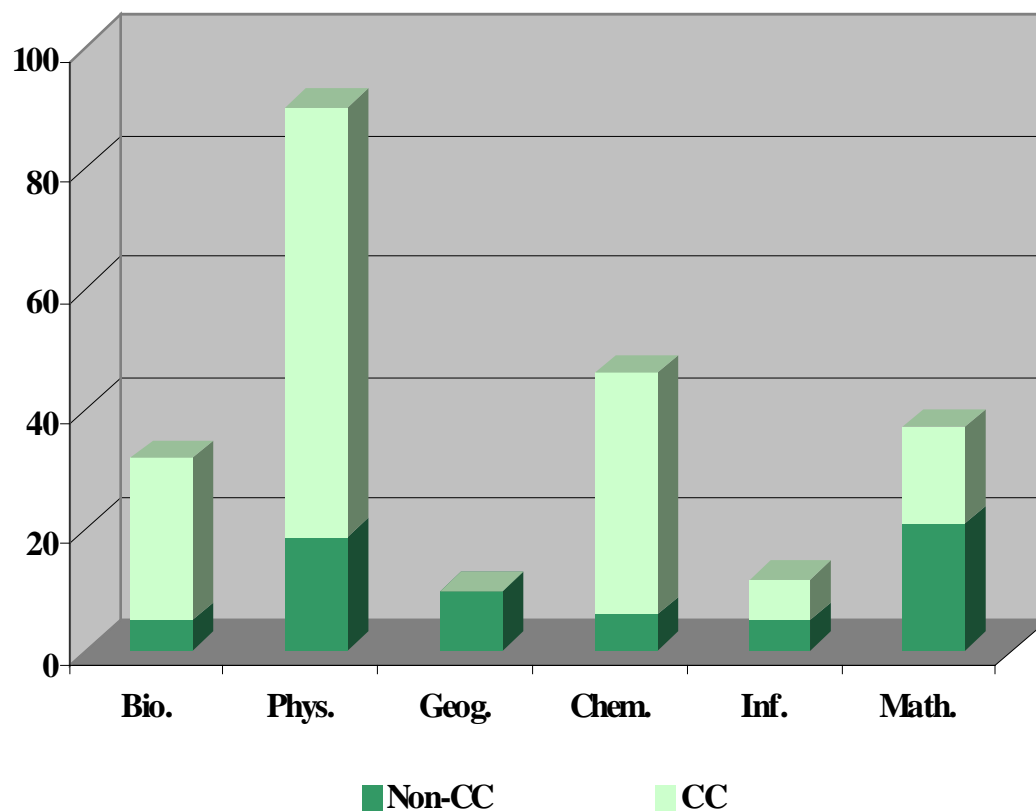
The number of Faculty publications and citations in the last five years is listed below.

	2005	2006	2007	2008	2009
Monographs and books	8	4	7	7	12
Textbooks	58	14	10	14	14
CC papers	117	142	148	157	161
Non-CC papers	97	55	89	85	66
Preprints and conference papers	118	117	144	92	122
Abstracts	164	131	161	139	186

Number of published papers



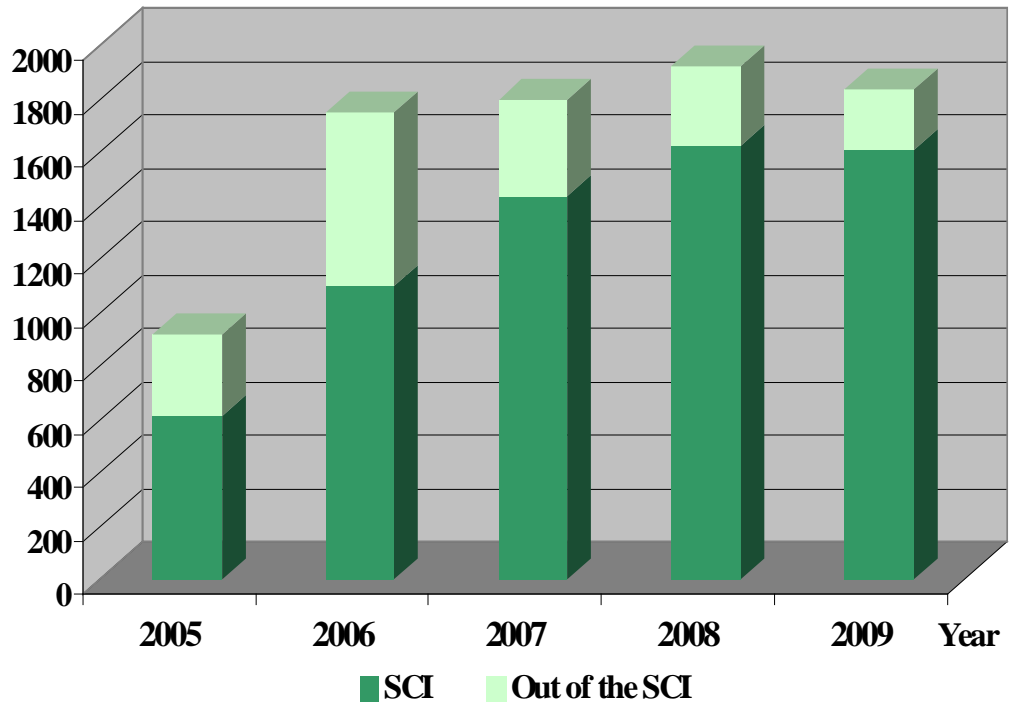
Number of published papers in the institutes in 2009



	2005	2006	2007	2008	2009
Citations total	916	1748	1796	1920	1832
SCI	608	1097	1432	1618	1602
non-SCI	308	651	364	302	230

Impact factor of the Faculty (a number of SCI citations divided by a number of SCI papers) in 2009 reached the value 9,9 (2008 - 10,3; 2007 - 9,9; 2006 - 7,7; 2005 - 5,2).

Development in the number of citations



AWARDS

Prof. Alexander Feher, DSc. (*Institute of Physics*)
Doctor honoris causa, Kharkiv University, Kharkiv 2009, Ukraina

M.Sc. Jozef Strečka, PhD. (*Institute of Physics*)

- *1. place in the young physicists competition of the scientific works (Slovak Physical Society)*

Dean's Prize for Science 2009, Teachers and Researchers

Prof. Peter Fedoročko, PhD., Biology and Ecology

Prof. Pavol Miškovič, DSc., Physics

Prof. Yaroslav Bazel', DSc., Chemistry

Assoc. Prof. Andrej Oriňák, PhD., Chemistry

Ondrej Hutník, PhD., Mathematics

Dean's Prize for Science 2009, PhD Students

Martin Kello, Biology and Ecology

Alena Radváková, Physics

Júlia Ričanová, Chemistry

Veronika Vaneková, Informatics

APPOINTMENTS IN 2009

Professors

Assoc. Prof. Peter Fedoročko, PhD.

*Professor of Biology
Since January 20, 2009*

Assoc. Prof. Peter Kollár, PhD.

*Professor of Physical Engineering
Since July 1, 2009*

Assoc. Prof. Pavol Sovák, PhD.

*Professor of Materials
Since July 1, 2009*

Associate Professors

Daniel Jancura, PhD.

*Assoc. Professor of Biophysics
Since November 30, 2009*

Tomáš Madaras, PhD.

*Assoc. Professor of Mathematics
Since March 1, 2009*

Štefan Parimucha, PhD.

*Assoc. Professor of Physics
Since June 29, 2009*

Rastislav Varga, PhD.

*Assoc. Professor of Physics
Since June 29, 2009*

Doctor of Sciences

Prof. Eva Čellárová, PhD.

*Doctor of Sciences
Since June 8, 2009*

INSTITUTES and DEPARTMENTS

Institute of BIOLOGY and ECOLOGY

Director:

Prof. Peter Fedoročko, PhD

Deputy Directors:

Assoc. Prof. Zuzana Daxnerová, PhD

Assoc. Prof. Martin Bačkor, PhD

Prof. Beňadik Šmajda, PhD

Departments:

Heads:

Department of Animal Physiology

Prof. Beňadik Šmajda, PhD

Department of Botany

Assoc. Prof. Pavol Mártonfi, PhD

Department of Cell Biology

Assoc. Prof. Zuzana Daxnerová, PhD

Department of Genetics

Prof. Eva Čellárová, DSc

Department of Zoology

Assoc. Prof. Igor Hudec, PhD

Division of Didactics of Biology

Assoc. Prof. Katarína Kimáková, PhD

Laboratory of Molecular-Biological

Prof. Peter Fedoročko, PhD

Diagnostics

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e-mail: ubv@upjs.sk

Secretary:

Darina Kováčová (Moyzesova 11)

Eva Husnajová (Mánesova 23)

Professors emeritus:

Ivan Ahlers, MD, DSc

Eva Ahlersová, MD, DSc

Róbert Hončariv, PhD

Professors:

Eva Čellárová, DSc

Peter Fedoročko, PhD

Miroslav Repčák, PhD

Eva Mišúrová, PhD

Beňadik Šmajda, PhD

Assoc. Professors:

Martin Bačkor, PhD

Zuzana Daxnerová, PhD

Marek Dudáš, MD, PhD

Igor Hudec, PhD

Monika Kassayová, PhD

Katarína Kimáková, PhD

Lubomír Kováč, PhD

Katarína Kropáčová, PhD

Pavol Mártonfi, PhD

Mária Miklošová, PhD

Lubomír Panigaj, PhD

Edita Paulíková, PhD

Peter Solár, PhD

Assist. Professors:

Bianka Bojková, PhD

Katarína Bruňáková, PhD

Mariana Kolesárová, PhD

Jana Koperdáková, PhD

Jozef Kováčik, PhD

Andrea Lešková, PhD

Peter Luptáčik, PhD

Anna Macková, PhD

Andrej Mock, PhD

Researchers:

Alexander Čanády, PhD

Adriana Eliášová, PhD

Ján Košuth, PhD.

Igor Majláth, PhD

Jaromír Mikeš, PhD

Peter Orendáš, PhD

Natália Raschmanová, PhD

Veronika Sačková, PhD

Martina Šemeláková, PhD

Martina Urbanová, PhD

PhD Students:

Soňa Báľentová, PhD

Miriam Bačkorová

Martin Bona

Peter Ferenc

Lenka Friedmanová-Kanková

Miroslava Garajová

Lucia Grada Kuliková

Viera Haňová

Mirka Hudáková

Rastislav Jendželovský, PhD

Jana Kisková

Terézia Kisková

Katarína Klemová

Hedviga Komarovská

Natália Kokošová

Ján Koval', PhD

Linda Petijová

Juraj Piovár

Matúš Skyba

Mária Starostová –Antalová

Juraj Ševc, PhD

Lenka Tomášová

Ivana Vantová

Domestic Cooperation:

Agricultural Farm, Stará Ľubovňa

Comenius University, Faculty of Natural Sciences, Bratislava

Educational and Counselling Centre of US Steel Košice, Košice-Šaca

Institute for Drugs Research, Modra

University of Veterinary Medicine and Pharmacology, Košice

Košice-Šaca Hospital, The First Private Hospital, Tissue Bank of the Burns Centre, Košice-Šaca

L. Pasteur Medical Faculty Hospital, Košice

Research Institute for Medicine, Modra

Slovak Academy of Sciences:

Institute of Plants Genetics and Biotechnology, Nitra;
Institute of Zoology, Košice,
Neurobiological Institute, Košice,
Parasitological Institute, Košice
Slovak Cave Administration, Liptovský Mikuláš
Water Research Institute, Bratislava
Technical University, Košice

Foreign Partners:

Academy of Sciences of the Czech Republic: Institute of Biophysics, Brno, Czech Republic
Agricultural Research Centre, Mikkeli, Finland
Baylor College of Medicine, Department of Molecular Virology, Houston, USA
Botanical Institute, Pruhonice, Czech Republic
Charles University, Faculty of Sciences, Prague, Czech Republic
Institute of Experimental Botany, Olomouc, Czech Republic
Institute of Soil Biology, České Budejovice, Czech Republic
Institute of Oncology, St. Petersburg, Russia
Intercell Biomedical Research and Development AG, Vienna, Austria
Masaryk University, Brno, Czech Republic
Polish Academy of Sciences, Institute of Nature Conservation, Kraków, Poland
Polish Academy of Sciences, Institute of Ecology, Lublin, Poland
Saint István University, Faculty of Horticultural Science, Budapest, Hungary
University of Oulu, Finland
University of Western Ontario, Faculty of Science, London, Canada
University of Siena, Italy
University of Parma, Italy
University of St. Kliment Ohridski, Sofia, Bulgaria
CRA, FSO, Experimental Unit for Floriculture and Ornamental Species, Sanremo, Italy
INFU, University of Dortmund, Germany

European Structural Fund Projects

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ITMS 26220120024, 2009-2011

Scientific Guarantor: Peter Fedoročko

Members: Marek Dudáš, Veronika Sačková, Eva Čellárová, Jaromír Mikeš, Martin Bačkor, Katarína Bruňáková, Ján Košuth, Jana Koperdáková (Institute of Biology and Ecology); Jozef Uličný, Daniel Jancura, Pavol Miškovský, Gregor Bánó, Zuzana Nad'ová (Institute of Physics)

Partners: Faculty of Medicine, Pavol Jozef Šafárik University in Košice

Selected Research Projects

Hypericum spp. as a source of bioactive substances with anticancer activity

APVV-0321-07

(Eva Čellárová, 02/2008 – 12/2010)

Fluorescent image analysis of irregularly shaped cells for the purposes of non-destructive DNA quantitation.

APVV-0682-07

(Marek Dudáš, 06/2008 - 12/2010)

Detection of chromosomal aberrations in living spermatozoa

AV 4/0029/07

(Marek Dudáš, 01/2007 – 12/2009)

Centre for Signalome Research

VVCE-0001-07

(Peter Fedoročko, 07/2008 – 12/2011)

Effects of low doses of ionizing radiation on behavior and neurogenesis in hippocampus in adult rats irradiated during different phases of embryonal development

VEGA 1/4345/07

(Beňadik Šmajda, 01/2007 – 12/2009)

Study of biological activities of secondary metabolites from lichens

VEGA 1/4337/07

(Martin Bačkor, 01/2007 – 12/2009)

Prevention of experimental mammary carcinogenesis in female rats by peroral antidiabetics

VEGA 1/4321/07

(Bianka Bojková, 01/2007 – 12/2009)

Pathogenesis and experimental repair of cleft palate in vitro: Molecular regulation of cell fates within the midline epithelial seam in Tgf- β 3 knockout mouse embryos

VEGA 1/4320/07

Marek Dudáš, 01/2007 – 12/2009

Impact of cell membrane (phospho)lipid content variation on proliferation and cell death of colon epithelial cells in model cancer therapy

VEGA 1/0240/08

(Peter Fedoročko, 01/2008 – 12/2010)

*Genetic aspects of the production of bioactive substances in the genus *Hypericum* spp.*

VEGA 1/0049/08

(Eva Čellárová, 01/2008 – 12/2010)

*Arthropod-borne pathogens of lizards from the family *Lacertidae* in the model area of Europe*

VEGA 1/0139/08

(Igor Majláth, 01/2008 – 12/2010)

*Evolutionary trends and taxonomy of the genus *Onosma* (Boraginaceae)*

VEGA 1/0012/08

(Pavol Mártonfi, 01/2008 – 12/2010)

Initial succession stage of soil-arthropod communities (Arthropoda) at spruce forest stands in the High Tatras (Slovakia) damaged by strong wind

VEGA 1/0019/08

(Ľubomír Kováč 01/2008 – 12/2010)

Taxonomy, zoogeography and ecology of cavernicolous Arthropoda of the Western Carpathians

VEGA 1/0139/09

(Andrej Mock 01/2009 – 12/2011)

Erythropoietin and its role in angiogenesis of ovarian adenocarcinoma cells

VEGA 1/0296/09

(Peter Solár 01/2009 – 12/2011)

Stress regulation of camomile (*Matricaria chamomilla* L.) metabolism

VEGA 1/0122/09

(Miroslav Repčák 01/2009 – 12/2011)

Selected Results

APVV 0321-07 (Čellárová): The possible microbial mechanism of hypericin and emodin biosynthesis was studied in the endophytic fungus isolated from *Hypericum perforatum*. In trying to ascertain the presence/expression of the candidate *hyp-1* gene in the endophyte, it was revealed that the *hyp-1* gene was absent indicating that the biosynthetic pathway in the endophytic fungus might be different and/or governed by a different molecular mechanism than the host plant (Kusari S., Zühlke S., Košuth J., Čellárová E., Spitteller M., J. Nat. Products 72 (2009) 1825-1835).

APVV -VVCE-0001-07 (Fedoročko): The results demonstrate that HY-PDT is able to degrade HER2 with an impact on its signaling cascade. Combination with AG 825 resulted in increased apoptosis induction, total degradation of HER2 and inhibition of colony formation. Downregulation of HSP90, Mcl-1, Bcl-xL and upregulation of Bax was also observed. This knowledge provides the basis for the possible application of HY-PDT in preclinical and clinical models of breast cancer treatment (Koval J., et al.: Photochemistry and Photobiology, 86:1, 200-205, 2010).

VEGA 1/0240/08 (Fedoročko): The interaction of hypericin with this cell drug-defence system is still unclear. We reported for the first time increased activity of MRP1 and BCRP in HT-29 colon cancer cells treated with hypericin per se. On the contrary, pre-treatment with proadifen (SKF525A) affected the function of MRP1 and BCRP leading to increased hypericin content, which might indicate a possible link between proadifen and these ABC transporter proteins. Subsequent enhanced intracellular oxidative stress was accompanied by loss of mitochondrial membrane potential, activation of caspase-9 and -3, PARP cleavage and onset of apoptosis. In conclusion, our study suggests that drug efflux transporters MRP1 and BCRP affect the pharmacokinetics of hypericin in HT-29 colon adenocarcinoma cells, and the action of hypericin-mediated PDT (HY-PDT) should be modulated by pre-treatment with their specific inhibitors (Jendželovský R. et al., Photochemical & Photobiological Sciences 8:12 (2009) 1716-1723).

VEGA 1/4345/07 (Šmajda): Female Wistar rats were irradiated on the 16th day of pregnancy with a 1 Gy dose of gamma-rays. The offspring of both sexes of irradiated, as well as nonirradiated mothers aged 3 months was tested in Morris' water maze, in open field test and in elevated plus-maze. The behavior of the animals was videorecorded and evaluated by a computer software. We established,

that he prenatal irradiation caused statistically significant short-term memory impairment, expressed as prolonged time and longer swimming track for finding the hidden platform, whereas the long-term memory was not affected. In the open field test the basal locomotor activity and the duration of the comfortable behavior (cleaning) were higher in irradiated animals of both sexes in comparison with controls. In elevated plus maze a shorter stay of irradiated animals in the open arms of the maze was observed. The level of neurogenesis in hippocampus was determined immunohistochemically after administration of bromodeoxyuridine (BrdU). (Šmajda B., Tomášová L., Phys. Res. 58 (2009) 480).

Selected Publications

ADC – Scientific works in the foreign Current Contents periodicals (25)

- ADC1 Agrobacterium rhizogenes-mediated transformation of *Hypericum tomentosum* L. and *Hypericum tetrapterum* Fries / Hedviga Komarovska ... [et al.]..
In: Zeitschrift für Naturforschung C-A Journal of Biosciences. -- ISSN 0939-5075. -- Vol. 64, no. 11-12 (2009), s. 864-868.
[KOMAROVSKÁ, Hedviga - GIOVANNINI, Annalisa - KOŠUTH, Ján - ČELLÁROVÁ, Eva]
- ADC2 Cadmium and nickel uptake are differentially modulated by salicylic acid in *Matricaria chamomilla* plants / Jozef Kováčik ... [et al.]..
In: Journal of Agricultural and Food Chemistry. -- ISSN 0021-8561. -- vol. 57, iss. 20 (2009), p. 9848-9855.
[KOVÁČIK, Jozef (40%) - GRÚZ, Jiří gruz (30%) - HEDBAVNÝ, Josef (20%) - KLEJDUS, Bořivoj (5%) - STRNAD, Miroslav (5%)]
- ADC3 Circadian rhythm of (Z)- and (E)-2beta-D-glucopyranosyloxy-4-methoxy cinnamic acids and herniarin in leaves of *Matricaria chamomilla* / Miroslav Repčák ... [et al.]..
In: Plant Cell Reports. -- ISSN 0721-7714. -- Vol. 28, iss. 7 (2009), p. 1137-1143.
[REPCÁK, Miroslav (25%) - ŠMAJDA, Beňadik (25%) - KOVÁČIK, Jozef (25%) - ELIAŠOVÁ, Adriana (25%)]
- ADC4 Comparison of cadmium and copper effect on phenolic metabolism, mineral nutrients and stress-related parameters in *Matricaria Chamomilla* plants / Jozef Kováčik ... [et al.]..
In: Plant and Soil. -- ISSN 0032-079X. -- Vol. 320 (2009), p. 231-242.
[KOVÁČIK, Jozef (40%) - KLEJDUS, Bořivoj (20%) - HEDBAVNÝ, Josef (20%) - ŠTORK, František (10%) - BAČKOR, Martin (10%)]
- ADC5 Conservative Management in Three Cases of Prenatally Recognized Splenic Cyst Using 2D, 3D, Multi-Slice and Doppler Ultrasonography / Robert Dankovcik ... [et al.]..
In: Fetal Diagnosis and Therapy. -- ISSN 1015-3837. -- Vol. 26, no. 3 (2009) s. 177-180.
[DANKOVČÍK, Róbert - URDŽÍK, Peter - LAZÁR, Igor - GREŠOVÁ, Andrea - RADOŇÁK, Jozef - JIRÁSEK, Jan Evangelista - KUČERA, Eduard - FEYEREISL, Jaroslav - DUDÁŠ, Marek]
- ADC6 *Cyanus triumfetti* subsp. *triumfetti* (Compositae) does not occur in the western Carpathians and adjacent parts of Pannonia: karyological and morphological evidence / Katarína Olšavská ... [et al.]..
In: Nordic Journal of Botany. -- ISSN 0107-055X. -- vol. 27, iss. 1 (2009) p. 21-36.
[OLŠAVSKÁ, Katarína - PERNÝ, Marián - MÁRTONFI, Pavol - HODÁLOVÁ, Iva]
- ADC7 Drug efflux transporters, MRP1 and BCRP, affect the outcome of hypericin-mediated photodynamic therapy in HT-29 adenocarcinoma cell / Rastislav Jendželovský ... [et al.]..
In: Photochemical & Photobiological Sciences. -- ISSN 1474-905X. -- Vol. 8, no. 12 (2009), s. 1716-1723.
[JENDŽELOVSKÝ, Rastislav (90%) - MIKEŠ, Jaromír (1%) - KOVAL, Ján (1%) - SOUČEK, Karel (1%) - PROCHÁZKOVÁ, Jiřina (1%) - KELLO, Martin (1%) -

- SAČKOVÁ, Veronika (1%) - HOFMANOVÁ, Jiřina (1%) - KOZUBÍK, Alois (1%) - FEDOROČKO, Peter (2%)]
- ADC8 Effect of *Atropa belladonna* L. on skin wound healing - Biomechanical and histological study in rats and in vitro study in keratinocytes, 3T3 fibroblasts, and human umbilical vein endothelial cells / Peter Gál ... [et al.]..
In: *Wound Repair and Regeneration*. -- ISSN 1067-1927. -- Vol. 17, no. 3 (2009), s. 378-386.
[GÁL, Peter (15%) - TOPORCER, Tomáš (13%) - GREDEL, Tomáš (10%) - VIDOVÁ, Zuzana (7%) - SMETANA, Karel, jr. (7%) - DVORÁNKOVÁ, Barbora (6%) - GÁL, Tomáš (6%) - MOZEŠ, Štefan (6%) - LENHARDT, Ludovít (6%) - LONGAUER, František (6%) - SABOL, Marián (6%) - SABO, Ján (6%) - BAČKOR, Martin (6%)]
- ADC9 Growth and functional responses of different cultivars of *Lotus corniculatus* to aluminum and low pH stress / Ján Pavlovkin ... [et al.]..
In: *Journal of Plant Physiology*. -- ISSN 0176-1617. -- Vol. 166, iss. 14 (2009), p. 1479-1487.
[PAVLOVKIN, Ján (30%) - PAĽOVE-BALANG, Peter (30%) - KOLAROVÍČ, Lukáš (30%) - ZELINOVÁ, Veronika (10%)]
- ADC10 Characterization of hairy root-phenotype in transgenic *Hypericum perforatum* / Jana Koperdáková ... [et al.]..
In: *Acta Physiologiae Plantarum*. -- ISSN 0137-5881. -- Vol. 31, iss. 2 (2009), p. 351-358.
[KOPERDÁKOVÁ, Jana - KOMAROVSKÁ, Hedviga - KOŠUTH, Ján - GIOVANNINI, Annalisa - ČELLÁROVÁ, Eva]
- ADC11 Impact of aluminum on phosphate uptake and acid phosphatase activity in root tips of *Lotus japonicus* / Veronika Zelinová ... [et al.]..
In: *Journal of Plant Nutrition*. -- ISSN 0190-4167. -- Vol. 32, iss. 10 (2009), p. 1633-1641.
[ZELINOVÁ, Veronika (20%) - HUTTOVÁ, Jana (20%) - MISTRÍK, Igor (20%) - PAĽOVE-BALANG, Peter (20%) - TAMÁS, Ladislav (20%)]
- ADC12 Interactions of lichens with heavy metals / M. Bačkor, S. Loppi..
In: *Biologia Plantarum*. -- ISSN 0006-3134. -- Vol. 53, iss. 2 (2009), p. 214-222.
[BAČKOR, Martin (60%) - LOPPI, Stefano (40%)]
- ADC13 Light-independent metabolomics of endophytic *Thielavia subthermophila* provides insight into microbial hypericin biosynthesis / Souvik Kusari ... [et al.]..
In: *Journal of Natural Products*. -- ISSN 0163-3864. -- vol. 72, no. 10 (2009), s. 1825-1835.
[KUSARI, Souvik - ZÜHLKE, Sebastian - KOŠUTH, Ján - ČELLÁROVÁ, Eva - SPITELLER, Michael]
- ADC14 Morphogenetic response to plant growth regulators in transformed and untransformed *hypericum perforatum* L. clones / Jana Koperdáková ... [et al.]..
In: *Acta Biologica Cracoviensia Series Botanica*. -- ISSN 0001-5296. -- vol. 51, iss. 1 (2009), p. 61-70.
[KOPERDÁKOVÁ, Jana - KATKOVČINOVÁ, Zuzana - KOŠUTH, Ján - GIOVANNINI, Annalisa - ČELLÁROVÁ, Eva]
- ADC15 Nickel uptake and its effect on some nutrient levels, amino acid contents and oxidative status in *Matricaria chamomilla* plants / Jozef Kováčik ... [et al.]..
In: *Water Air and Soil Pollution*. -- ISSN 0049-6979. -- vol. 202, iss. 1-4 (2009), p. 199-209.
[KOVÁČIK, Jozef (50%) - KLEJDUS, Bořivoj (20%) - HEDBAVNY, Josef (20%) - BAČKOR, Martin (10%)]
- ADC16 Nitric oxide signals ROS scavenger-mediated enhancement of PAL activity in nitrogen-deficient *Matricaria Chamomilla* roots: side effects of scavengers / Jozef Kováčik, Bořivoj Klejdus, Martin Bačkor..
In: *Free Radical Biology and Medicine*. -- ISSN 0891-5849. -- vol. 46, iss. 12 (2009), p. 1686-1693.

- [KOVÁČIK, Jozef (50%) - KLEJDUS, Bořivoj (30%) - BAČKOR, Martin (20%)]
- ADC17 Phenolic glucosides in the course of ligulate flower development in diploid and tetraploid *Matricaria chamomilla* / Miroslav repčák, Tatiana Krausová.
In: Food Chemistry. -- ISSN 0308-8146. -- vol. 116, iss. 1 (2009) p. 19-23.
[REPČÁK, Miroslav (50%) - KRAUSOVÁ, Tatiana (50%)]
- ADC18 Phenolic metabolism of *Matricaria chamomilla* plants exposed to nickel / Jozef Kováčik, Bořivoj Klejdus, Martin Bačkor..
In: Journal of Plant Physiology. -- ISSN 0176-1617. -- Vol. 166, iss. 13 (2009), p. 1460-1464.
[KOVÁČIK, Jozef (50%) - KLEJDUS, Bořivoj (40%) - BAČKOR, Martin (10%)]
- ADC19 Physiological adaptations in the lichens *Peltigera rufescens* and *Cladina arbuscula* var. *mitis*, and the moss *Racomitrium lanuginosum* to copper-rich substrate / Martin Bačkor ... [et al.]..
In: Chemosphere. -- ISSN 0045-6535. -- Vol. 76, iss. 10 (2009), p. 1340-1343.
[BAČKOR, Martin (50%) - KLEJDUS, Bořivoj (20%) - VANTOVÁ, Ivana (10%) - KOVÁČIK, Jozef (20%)]
- ADC20 Physiological comparison of copper toxicity in the lichens *Peltigera rufescens* (Weis) Humb. and *Cladina arbuscula* subsp. *mitis* (Sandst.) Ruoss / Martin Bačkor ... [et al.]..
In: Plant Growth Regulation. -- ISSN 0167-6903. -- Vol. 58, iss. 3 (2009), p. 279-286.
[BAČKOR, Martin (40%) - KOVÁČIK, Jozef (20%) - DZUBAJ, Alexander (20%) - BAČKOROVÁ, Miriam (20%)]
- ADC21 Physiological effects of a geothermal element: boron excess in the epiphytic lichen *Xanthoria parietina* (L.) TH. FR. / Tommaso Pisani ... [et al.]..
In: Chemosphere. -- ISSN 0045-6535. -- Vol. 76, iss. 7 (2009), p. 921-926.
[PISANI, Tommaso (20%) - MUNZI, Silvana (20%) - PAOLI, Luca (20%) - BAČKOR, Martin (20%) - LOPPI, Stefano (20%)]
- ADC22 Physiology of *Matricaria chamomilla* exposed to nickel excess / Jozef Kováčik ... [et al.]..
In: Ecotoxicology and Environmental Safety. -- ISSN 0147-6513. -- Vol. 72 (2009), p. 603-609.
[KOVÁČIK, Jozef (50%) - KLEJDUS, Bořivoj (30%) - KADUKOVÁ, J. (10%) - BAČKOR, Martin (10%)]
- ADC23 Role of Radial Glia in Transformation of the Primitive Lumen to the Central Canal in the Developing Rat Spinal Cord / Juraj Ševc, Zuzana Daxnerová, Mária Miklošová..
In: Cellular and Molecular Neurobiology. -- ISSN 0272-4340. -- Vol. 29, iss. 6-7 (2009), p. 927-936.
[ŠEVC, Juraj - DAXNEROVÁ, Zuzana - MIKLOŠOVÁ, Mária]
- ADC24 Salicylic acid alleviates NaCl-induced changes in the metabolism of *Matricaria chamomilla* plants / Jozef Kováčik ... [et al.]..
In: Ecotoxicology. -- ISSN 0963-9292. -- vol. 18, iss. 5 (2009), p. 544-554.
[KOVÁČIK, Jozef (50%) - KLEJDUS, Bořivoj (20%) - HEDBAVNY, Josef (20%) - BAČKOR, Martin (10%)]
- ADC25 Salicylic acid-induced changes to growth and phenolic metabolism in *Matricaria chamomilla* plants / Jozef Kováčik ... [et al.]..
In: Plant Cell Reports. -- ISSN 0721-7714. -- Vol. 28 (2009), p. 135-143.
[KOVÁČIK, Jozef (50%) - GRÚZ, Jiří (30%) - BAČKOR, Martin (10%) - STRNAD, Miroslav (5%) - REPČÁK, Miroslav (5%)]

ADD - Scientific works in the domestic Current Contents periodicals (2)

- ADD1 *Echinoparyphium limosorum* n. sp. (Trematoda: Echinostomatidae) from Blacktailed Godwit, *Limosa limosa* (Aves, Charadriiformes) in Slovakia / J.K. Macko, M. Špakulová, A. Macková..

In: Helminthologia. -- ISSN 0440-6605. -- Roč. 46, č. 4 (2009), s. 220-224.

[MACKO, Jozef Kazimír (40%) - ŠPAKULOVÁ, Marta (30%) - MACKOVÁ, Anna (30%)]

ADD2 Metformin in chemically-induced mammary carcinogenesis in rats / B. Bojkova ... [et al.]..

In: Neoplasma. -- ISSN 0028-2685. -- Roč. 56, č. 3 (2009), s. 269-274.

[BOJKOVÁ, Bianka (30%) - ORENDÁŠ, Peter (20%) - GARAJOVÁ, Miroslava (10%) - KASSAYOVÁ, Monika (10%) - KÚTNA, Viera (10%) - AHLERSOVÁ, Eva (10%) - AHLERS, Ivan (10%)]

ADE - Scientific works in the foreign non Current Contents periodicals (1)

ADE1 First knowledge of winter ecology of the Mound-building mouse (*Mus spicilegi* Petényi, 1882) from Slovakia / Alexander Čanády, Ladislav Mošanský, Michal Stanko..

In: Acta Zoologica Bulgarica. -- ISSN 032-0770. -- Vol. 61, iss. 1 (2009), p. 79-86.

[ČANÁDY, Alexander (80%) - MOŠANSKÝ, Ladislav (10%) - STANKO, Michal (10%)]

ADF - Scientific works in the domestic non Current Contents periodicals (4)

ADF1 Paradoxes in medicine: an access to new knowledge? / Ginter, E., Simko, V., Dolinska, S..

In: Bratislavské lekárske listy : Bratislava Medical Journal. -- ISSN 0006-9248. -- Roč. 110, č. 2 (2009), s. 112-115.

[GINTER, Emil (35%) - ŠIMKO, V. (30%) - DOLINSKÁ, Saskia (35%)]

ADF2 Príspevok k poznaniu spoločností suchozemských článkonožcov (Arthropoda) vybraných jaskýň orografického celku Čierna hora so zvláštnym zreteľom na mnohonôžky (Diplopoda) / Katarína Necpálová, Ľubomír Kováč, Andrej Mock..

In: Folia Faunistica Slovaca. -- ISSN 1335-7522. -- roč. 14, č. 1 (2009), s. 1-15.

[NECPÁLOVÁ, Katarína (40%) - KOVÁČ, Ľubomír (30%) - MOCK, Andrej (30%)]

ADF3 Spoločenstvá fauny Brestovskej jaskyne (Západné Tatry) / Ľubomír Kováč ... [et al.]..

In: Slovenský kras : Acta Carsologica Slovaca. -- ISSN 0560-3137. -- roč. 46, suppl. 1 (2008) s. 97-110.

[KOVÁČ, Ľubomír (30%) - MOCK, Andrej (30%) - VIŠŇOVSKÁ, Zuzana (20%) - LUPTÁČIK, Peter (20%)]

ADF4 Terestrické bezstavovce (Evertebrata) jaskýň vo vulkanitoch Cerovej vrchoviny / Vladimír Papáč ... [et al.]..

In: Aragonit : časopis Správy slovenských jaskýň. -- ISSN 1335-213X. -- Roč. 14, č. 1 (2009), s. 32-42.

[PAPÁČ, Vladimír (30%) - FENĎA, Peter (30%) - LUPTÁČIK, Peter (10%) - MOCK, Andrej (10%) - SVATONĚ, Jaroslav (10%) - CHRISTOPHORYOVÁ, Jana (10%)]

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Kamil Tóth

Alena Uhríková

Ján Ungvarský

Marianna Vargová

Anna Vandžurová

Petra Vasil'ková

Peter Vranec

Jozef Parnica

Domestic Cooperation

CHEMKO Co., Strážske

*Comenius University, Faculty of Science, Faculty of Physics, Mathematics and Informatics
Bratislava*

Georganics Co., Bratislava

HSC Service Co., Bratislava

Matej Bel University, Banská Bystrica

Merck Ind-Lab, Co., Bratislava

Research Institute for Soil Fertility, Bratislava

Rhodia Industrial Yarns Slovakia, Co., Humenné

Slovak Academy of Sciences:

Institute of Chemistry, Bratislava,

Institute of Experimental Physics, Košice,

Institute of Material Research, Košice,

Institute of Physiology of Livestock, Košice

Slovak Technical University, Faculty of Chemical Technology, Bratislava

Synkola Co., Bratislava

Technical University, Faculty of Metallurgy, Košice

TEHO Co., Košice

Foreign Partners

Academy of Sciences of the Czech Republic:

Institute of Biophysics, Brno,

Institute of Inorganic Chemistry, Prague,

Institute of Macromolecular Chemistry, Prague,

Institute of Organic Chemistry and Biochemistry, Prague,

J. Heyrovský Institute of Physical Chemistry and Electrochemistry, Prague,

Charles University Prague, Czech Republic

Department of Human Biological Chemistry and Genetics, Galveston, USA

Eötvös L. University Budapest, Hungary

Ernst-Moritz-Arndt-University, Greifswald, Germany

F. Schiller University, Jena, Germany

Health Science Center, San Antonio, USA

Hokkaido University, Sapporo, Japan

Humboldt University, Berlin, Germany
Martin Luther University, Halle, Germany
Masaryk University Brno, Czech Republic
Novartis AG, Switzerland
Palacký University Olomouc, Czech Republic
Pedagogical Academy Graz, Austria
Pedagogical Institute Linz, Austria
Pedagogical Academy Vienna, Austria
Philipps-Universität Marburg, Germany
Polish Academy of Science, Institute of Physical Chemistry, Warsaw, Poland
Syngenta/Novartis AG, Basel, Switzerland
Tohoku University, Sendai, Japan
University of Amsterdam, Netherlands
University of Bayreuth, Germany
University of Bologna, Italy
University of Cairo, Egypt
University of Catania, Italy
University of Duisburg, Germany
University of Lausanne, Switzerland
University of Liverpool, UK
University of Münster, Germany
University of Parma, Italy
University of Perugia, Italy
University of Poitiers, France
University of Sapporo, Japan
University of Strasburg, France
University Texas, USA
University of Turku, Finland
University of Vienna, Austria
University of Venice, Italy
University of York, Canada
University of Zagreb, Croatia
University of Zürich, Switzerland

Selected Research Projects

1-Methoxyindole phytoalexins and their analogs as a new type of compounds with antitumor activity

APVV-0514-06

(Peter Kutschy, 01/2007 – 12/2009)

Anticancer effect of natural compounds: focus to angiogenesis.

APVV-0325-07

(Peter Kutschy, 01/2008 – 12/2010)

Compactizing, microstructure and properties of microcomposite materials based on coated Fe powders

APVV-0490-07

(Andrej Oriňák, 01/2008 – 12/2010)

Establishment of center of excellence of (bio)separation methods as based on principles of electroseparations, liquid chromatography and mass spectrometry

VVCE-0070-07

(Andrej Oriňák, 07/2008 – 06/2011)

Education of Chemistry and Science Teachers to the Selected Topics of Sustainable Development Using Blended Learning Approach.

KEGA 3/6301/08

(Mária Ganajová, 01/2008 – 12/2010)

Synthesis and the study of photochromic molecular switches with diarylethylene skeleton

VEGA 1/4459/07

(Martin Walko, 01/2007 – 12/2009)

Chromatography analysis Development of chiral and pharmaceutically important compounds by LC techniques.

VEGA 1/4461/07

(Taťána Gondová, 01/2007 – 12/2009)

Application of complex-forming reagents for development of novel procedures for the separation, preconcentration and determination of biologically relevant analytes

VEGA 1/4451/07

(Vasiľ Andruch, 01/2007 – 12/2009)

Molecular mechanisms of protein stability

VEGA SAV 2/6167/27

(Marián Antalík, 01/2007 – 12/2009)

Conformation, function and sequence diversity of flavoproteins and homodimeric oxidases.

VEGA 1/4319/07

(Ladislav Janovec, 01/2007 – 12/2009)

Study the optical and electrochemical properties of the ion associates based on the selected organic bases for the preparation of new sensors and development of analytical procedures

VEGA 1/4450/07

(Yaroslav Bazel', 01/2007 – 12/2009)

New acridine antitumor, antiviral and neuroprotection pharmacophors.

VEGA 1/0476/08

(Ján Imrich, 01/2008 – 12/2010)

Nanoporous sorbents for capture and separation of carbon dioxide.

VEGA 1/0119/08

(Vladimír Zeleňák, 01/2008 – 12/2010)

The study of new generation of environmental nanosorbents and carriers based on porous materials.

VEGA 1/0107/08

(Mária Reháková, 01/2008 – 12/2010)

Study of stereoselectivity of [3,3]-sigmatropic rearrangements induced with local microwave irradiation.

VEGA 1/0281/08

(Jozef Gonda, 01/2008 – 12/2010)

Low-dimensional compounds containing cyano groups.

VEGA 1/0079/08

(Ivan Potočňák, 01/2008 – 12/2010)

Elektrolytical preparation and characterisation of nanocomposite coatings in order to enhance the corrosion resistivity and catalytic activity.

VEGA 1/0043/08

(Renáta Oriňáková, 01/2008 – 12/2010)

Novel DNA intercalators: anticancer and antimicrobial proflavine pharmacophor- and peptide-acridine complexes

VEGA 1/0053/08

(Mária Kožurková, 01/2008 – 12/2010)

The New Zinc(II) Coordination Compounds Interesting from Their Antimicrobial and Antifungal Activity.

VEGA 1/0122/08

(Katarína Györyová, 01/2008 – 12/2010)

Magnetic materials based on coordination compounds

VEGA 1/0089/09

(Juraj Černák, 01/2009 – 12/2011)

Stereoselective synthesis of mycetericins and their analogues

VEGA 1/0100/09

(Miroslava Martinková, 01/2009 – 12/2011)

Alternative structural motifs in DNA regulating regions: mutagenesis, chromosomal rearrangements and genetic diseases

VEGA 1/0153/09

(Viktor Víglaský, 01/2009 – 12/2011)

Biomacromolecule-nanoparticles complexes

VEGA 2/0038/09

(Marián Antalík, 01/2009 – 12/2011)

Selected Results

APVV-0514-06 (Kutschy): New analogs of indole phytoalexin 1-methoxyspirobrassinol methyl ether have been designed by replacement of its 2-methoxy group with 2-(substituted phenyl)amino group. Synthesized by spirocyclization methodology, trans- and cis-diastereoisomers of target compounds were isolated and evaluated as potential anticancer agents. Antiproliferative activity against selected human solid tumor and leukemia cell lines in vitro (Jurkat, MCF-7, MDA-MB-231, HeLa, CCRF-CEM and A-549) was examined. Several compounds have potencies higher than or comparable to cisplatin on Jurkat cells, etoposide on MDA-MB-231 cells, and doxorubicin on A-549 cells. (Kutschy P., Salayová A., Čurillová Z., Kožár T., Mezenec R., Mojžiš J., Pilátová M., Balentová E., Pazdera P., Sabol M., Zburová M., *Bioorg. Med. Chem.* 17 (2009) 2698-3712).

VEGA 1/4450/07 (Bazel’): Study of optical and electrochemical properties of cationic dyes from the group of polymethine dyes. Investigation of conditions of ion associate formation with inorganic and organic ions, constitution, mechanism and chemical-analytical properties. Preparation of membranes for potentiometric sensors suitable for determination of inorganic (Cl, Au, Hg, Zn, Pd, Pt) and organic (picric acid, diclofenac, piroxicam, indomethacin etc.) analytes. Development of new analytical methods for determination of selected inorganic (Au, Os, Ru, Cu, Fe, Mn, Zn, Mo) and organic (ascorbic acid, dinitrobenzoic acid, diclofenac, piroxicam, indomethacin, ketoprofen) compounds, evaluation of their metrological characteristics and their verifying on real samples (pharmaceutical materials, biological materials, units of environment). (Y. Bazel, I. Hunka, Z. Kormosh, V. Andruch. *Spectrochim. Acta A.* 74 (2009).1209–1214; Z. Kormosh, I. Hunka, Y. Bazel., *Mater. Sci. Eng. C.* 29 (2009) 1018-1022.)

VEGA 1/4461/07 (Gondová): Three simple TLC methods with densitometric detection were proposed for the simultaneous separation of six new antidepressants commonly used in clinical practice. Proposed methods were validated and used for the determination of antidepressants in selected pharmaceutical preparations. One of the method was applied for analysis of SSRI antidepressants in forensic samples. Direct chiral separation of new bioactive indole cruciferous phytoalexin analogs was studied using HPLC with teicoplanin. Thermodynamic study of separation was realised and effect of analytes structure on retention parameters as well as chiral recognition was investigated. For selective preconcentration and analysis of steroids from biological fluids the combination of HPLC with novel MISPE extraction was used. (Gondová T., Halamová D., Špacayová K., *J. Liq. Chromatogr. Rel. Technol.* 31 (2008) 2429-2441).

VEGA 1/0122/08 (Győryová): New zinc coordination compounds based on arylcarboxylic acids (salicylates and 5-chlorosalicylates, 2-bromobenzoates) with N-, O- and S- donor ligands (methyl-3-pyridylcarbamate, urea, theophylline) have been prepared. The prepared compounds were characterised by elemental analysis, IR spectroscopy, mass spectrometry and thermal analysis. The mechanism of the thermal decomposition was explained. Biological activity of some prepared compounds was studied. Compounds with suitable crystals were investigated by rtg structural analysis. In case of zinc(II) 2-bromobenzoato complex, the polymeric structure was obtained in solid state and zinc atom has tetrahedral coordination environment (Bujdošová Z., Győryová K., Kovářová J., Hudecová D., Halás L., *J. Therm Anal Calorim.* 98 (2009) 151-159; Erdélyiová A., Győryová K., Gyepes R., Halás L., Kovářová J., *Polyhedron* 28 (2009) 131-137).

VEGA 1/0053/08 (Kožurková) The project was focused on study of new substituted derivatives of acridine with DNA, to identify the binding mode and determine the binding constants. For these purposes, spectroscopic methods were used. We tested the potential antitumor effects of these compounds and examined inhibition of topoisomerase I. (Vantová Z., Paulíková H., Sabolová D., Kožurková M., Sucháňová M., Janovec L., Kristian P., Imrich J., International Journal of Biological Macromolecules. 45 (2009) 174-180).

VEGA 1/0119/08 (Zeleňák): In the frame of the project we have studied periodic nanoporous silica (PNS) and metal-organic frameworks (MOF). We have prepared PNS, which was surface modified by functional groups. The prepared materials were studied by the means of HRTEM microscopy, SAXS and XRD measurements, nitrogen and carbon dioxide adsorption/desorption. The isosteric heats of adsorption of carbon dioxide were measured. Moreover we have synthesized novel layer-pillared metal-organic framework $\{[\text{Zn}_2(\text{OH})(\text{AZPY})(\text{BDC})_{1.5}]\cdot\text{H}_2\text{O}\}_n$. The complex has opened structure containing small structure channels that are propagated along [011] crystallographic direction. The adsorption studies reveal that prepared compound can adsorb nitrogen and carbon dioxide. (V. Zeleňák, Z. Vargová, M. Almáši, A. Zeleňáková, J. Kuchár, Microp. Mesop. Materials, 129(2010)354; V. Zeleňák, A. Zeleňáková, J. Kováč, Colloids and Surfaces A: Physicochem. Eng. Aspects, 2010, doi:10.1016/j.colsurfa.2010.01.001)

VEGA 1/0089/09 (Černák): Molecular magnet $[\text{Ni}(\text{fum})(\text{phen})]$ (fum = fumarato, phen = phenatroline) was prepared using solvothermal conditions and it exhibits 2D crystal structure, in which $\{\text{Ni}_2\}$ dimers are bridged by fum ligands. Magnetic measurements confirmed the existence of antiferromagnetic dimers with intradimer coupling constant $D/J = 1$ K. From analogous system based on (di-2-pyridyl) amine (dpya) and maleato ligands (mal) single crystals of $[\text{Ni}(\text{dpya})_2\text{NO}_3]\text{NO}_3$ were formed; its direct synthesis lead to formation of twinned crystals. The outstanding feature of the $\text{Cu}_3\{\text{Pd}(\text{CN})_4\}_2\text{Br}_2\cdot\text{H}_2\text{O}$ (tacn = 1,4,7-triazacyklononane) compound is the existence of two different 1D structure motifs in its crystal structure: 2,2-chains $[\text{Cu}(\text{tacn})\text{NC-Pd}(\text{CN})_2\text{CN}]$ and 2,4-ribbons $[\text{Cu}(\text{tacn})(\text{NC})_2\text{Pd}(\text{CN})_2\text{Cu}(\text{tacn})]_n^{2n+}$ (Černák J., Pavlová A., Orendáčová A., Kajňáková M., Kuchár J., Polyhedron 28 (2009) 2893-2898; Černák J., Pavlová A., Dušek M., Fejfarová K., Acta Crystallographica Section C – Crystal Structure Communications C65 (2009) m260-m262).

Selected Publications

ADC - Scientific works in the foreign Current Contents periodicals (42)

- ADC1 2-(substituted phenyl)amino analogs of 1-methoxyspirobrassinol methyl ether: synthesis and anticancer activity / Peter Kutschy ... [et al.]..
In: Bioorganic & Medicinal Chemistry. -- ISSN 0968-0896. -- Vol. 17, iss. 10 (2009), p. 3698-3721.
[KUTSCHY, Peter (15%) - SALAYOVÁ, Aneta (15%) - ČURILLOVÁ, Zuzana (10%) - KOŽÁR, Tibor (10%) - MEZENECV, Roman (10%) - MOJŽIŠ, Ján (10%) - PILÁTOVÁ, Martina (10%) - BALENTOVÁ, Eva (5%) - PAZDERA, Pavel (5%) - SABOL, Marián (5%) - ZBUROVÁ, Michaela (5%)]
- ADC2 Anomalous coating of Iron microparticles by Ni-Co layers in the 3D stirred heterogenous system: Impedance study / Miroslav Gál ... [et al.]..
In: Journal of the Electrochemical Society. -- ISSN 0013-4651. -- vol. 156, iss. 11 (2009) p. D462-D468.
[GÁL, Miroslav (40%) - ORIŇÁKOVÁ, Renáta (40%) - WIEMHÖFER, Hans-Dieter (5%) - CHOVAN, Peter (5%) - KRAJNÍKOVÁ, Annamária (5%) - HÍVEŠ, Ján (5%)]

- ADC3 A novel two-dimensional Ni(II) fumarate complex: Solvothermal synthesis, crystal structure and magnetic properties / Juraj Černák ... [et al.]..
In: Polyhedron. -- ISSN 0277-5387. -- Vol.28, (2009), p. 2893-2898.
[ČERNÁK, Juraj (30%) - PAVLOVÁ, Anna (25%) - ORENDÁČOVÁ, Alžbeta (25%) - KAJŇAKOVÁ, Marcela (10%) - KUCHÁR, Juraj (10%)]
- ADC4 A potentiometric sensor for the determination of diclofenac / Zh.A. Kormosh, I.P.Hunka, Ya.R.Bazel..
In: Journal of Analytical Chemistry. -- ISSN 1061-9348. -- vol. 64, no. 8 (2009), s. 853-858.
[KORMOSH, Zholt - HUNKA, Iryna - BAZEL, Yaroslav R.]
- ADC5 A simple method of boron determination in mineral waters using Victoria blue 4R / Ioseph s. Balogh ... [et al.]..
In: International Journal of Environmental Analytical Chemistry. -- ISSN 0306-7319. -- vol. 89, no. 6 (2009), s. 449-459.
[BALOGH, Ioseph S. (16%) - ANDRUCH, Vasil' (16%) - KÁDÁR, Mihály (16%) - BILLES, Ferenc (16%) - POSTA, József (16%) - MIKOLAJOVÁ, Eva (16%)]
- ADC6 Bis(di-2-pyridylamine-κN2,N2')(nitrate-κO,O')nickel(II) nitrate / Juraj Černák ... [et al.]..
In: Acta Crystallographica Section C - Crystal Structure Communications. -- ISSN 0108-2701. -- Vol. C65 (2009), p. m260-m262.
[ČERNÁK, Juraj (30%) - PAVLOVÁ, Anna (30%) - DUŠEK, Michal (30%) - FEJFAROVÁ, Karla (10%)]
- ADC7 Computational study to assign structure, tautomerism, E/Z and s-cis/s-trans isomerism, π-delocalization, partial aromaticity, and the ring size of 1,3-thiazolidin-4-ones and 1,3-thiazin-4-ones formed from thiosemicarbazides / Stanislav Böhm ... [et al.]..
In: Journal of Molecular Structure - THEOCHEM. -- ISSN 0166-1280. -- vol. 916, no. 1-3 (2009), s. 105-118.
[BÖHM, Stanislav - TOMAŠČIKOVÁ, Jana - IMRICH, Ján - DANIHEL, Ivan - KRISTIAN, Pavol - KOCH, Andreas - KLEINPETER, Erich - KLIKA, Karel D.]
- ADC8 Cu-Ni hetero-bimetallic compounds, Part 1: Preparation, structure and properties of [Cu_{0.05}Ni_{0.95}(bpy)₂(ox)]₂·4H₂O / Juraj Kuchár ... [et al.]..
In: Solid State Sciences. -- ISSN 1293-2558. -- Vol. 11 (2009), p. 950-955.
[KUCHÁR, Juraj - ČERNÁK, Juraj - SABOVÁ, Ivana - KAPPENSTEIN, Charles - KAJŇAKOVÁ, Marcela - ORENDÁČ, Martin - BOČA, Roman (10%)]
- ADC9 Cytotoxic activity of acridin-3,6-diyl dithiourea hydrochlorides in human leukemia line HL-60 and resistant subline HL-60/ADR / Zuzana Vantová ... [et al.]..
In: International Journal of Biological Macromolecules. -- ISSN 0141-8130. -- Vol. 45 (2009), p. 174-180.
[VANTOVÁ, Zuzana - PAULÍKOVÁ, Helena - SABOLOVÁ, Danica - KOŽURKOVÁ, Mária - SUCHÁŇOVÁ, Mária - JANOVEC, Ladislav - KRISTIAN, Pavol - IMRICH, Ján]
- ADC10 Determination of Cu(III) in semiconductor ceramics using cationic violet reagent / Ioseph S. Balogh ... [et al.]..
In: Microchimica Acta. -- ISSN 0026-3672. -- vol. 166, no. 1-2 (2009), s. 145-150.
[BALOGH, Ioseph S. (25%) - RUSCHAK, Michael (25%) - ANDRUCH, Vasil' (25%) - BILLES, Ferenc (25%)]
- ADC11 Effects of urea and acetic acid on the heme axial ligation structure of ferric myoglobin at very acidic pH / Enrica Droghetti ... [et al.03]..
In: Archives of Biochemistry and Biophysics. -- ISSN 0003-9861. -- vol. 489 (2009), p. 68-75.
[DROGHETTI, Enrica (20%) - SUMITHRAN, Suganya (10%) - SONO, Masanori (10%) - ANTALÍK, Marián (20%) - FEDURCO, Milan (10%) - DAWSON, John H. (10%) - SMULEVICH, Giulietta (20%)]
- ADC12 Estrogens and their analytics hyphenated separation techniques / Júlia Ričanová ... [et al.]..

- In: Critical Reviews in Analytical Chemistry. -- ISSN 1040-8347. -- vol. 39, no. 1 (2009), s. 11-29.
[RIČANYOVÁ, Júlia - GADZALA-KOPCIUCH, Renata - REIFFOVÁ, Katarína - BUSZEWSKI, Boguslav]
- ADC13 Exchange bias in iron-oxide particles nanocasted in periodic porous silica / A. Zeleňáková, J. Kováč, V. Zeleňák.
In: Acta Physica Polonica A. -- ISSN 0587-4246. -- vol. 115, iss. 1 (2009), p. 357-359.
[ZELEŇÁKOVÁ, Adriana (50%) - KOVÁČ, Jozef (25%) - ZELEŇÁK, Vladimír (25%)]
- ADC14 Changes in thermodynamic stability of von Willebrand factor differentially affect the force-dependent binding to platelet GPIb α / Matthew Auton ... [et al.].
In: Biophysical Journal. -- ISSN 0006-3495. -- vol. 97, iss. 2 (2009), s. 618-627.
[AUTON, Matthew (10%) - SEDLÁK, Erik (40%) - MAREK, Jozef (10%) - WU, Tao (10%) - ZHU, Cheng (10%) - WU, Tao (10%)]
- ADC15 Changes in thermodynamic stability of von Willebrand factor differentially affect the force-dependent binding to platelet GPIb α / Matthew Auton ... [et al.].
In: Biophysical Journal. -- ISSN 0006-3495. -- vol. 97, iss.2 (2009), p. 618-627.
[AUTON, Matthew (10%) - SEDLÁK, Erik (40%) - MAREK, Jozef (10%) - WU, Tao (10%) - ZHU, Cheng (10%) - CRUZ, Miguel A. (20%)]
- ADC16 Improved lithium exchange at LiFePO₄ cathode particles by coating with composite polypyrrole-polyethylene glycol layers / Andrea Fedorková ... [et al.].
In: Journal of Solid State Electrochemistry. -- ISSN 1432-8488. -- Vol. 13, iss. 12 (2009), p. 1867-1872.
[FEDORKOVÁ, Andrea (30%) - WIEMHÖFER, Hans-Dieter (20%) - ORIŇÁKOVÁ, Renáta (15%) - ORIŇÁK, Andrej (15%) - STAN, Marian Cristian (5%) - WINTER, Martin (5%) - KANIANSKY, Dušan (5%) - ALEJOS, Ana Nacher (5%)]
- ADC17 Influence of surface effects on magnetic behavior of hematite nanoparticles embedded in porous silica matrix / Vladimír Zelenak ... [et al.].
In: Journal of Physical Chemistry C. -- ISSN 1932-7447. -- Vol. 113, iss. 30 (2009), p. 13045-13050.
[ZELEŇÁK, Vladimír (45%) - ZELEŇÁKOVÁ, Adriana (45%) - KOVÁČ, Jozef (10%) - VAINIO, Ulla (5%) - MURAFKA, Natalia (5%)]
- ADC18 Interplay of frustration and magnetic field in the two-dimensional quantum antiferromagnet Cu(tn)C12 / A. Orendáčová ... [et al.].
In: Physical Review B. -- ISSN 1098-0121. -- Vol. 80, no. 14 (2009), s. 144418-1 - 144418-8.
[ORENDÁČOVÁ, Alžbeta - ČIŽMÁR, Erik - SEDLÁKOVÁ, Lucia - HANKO, Ján - KAJŇÁKOVÁ, Marcela - ORENDÁČ, Martin - FEHER, Alexander - XIA, J.S. - YIN, L. - PAJEROWSKI, Daniel M. - MEISEL, Mark Wiliam - ZELEŇÁK, Vladimír - ZVYAGIN, S.A. - WOSNITZA, Jochen]
- ADC19 Investigation of the reaction of gold(III) with 2-[2-(4-dimethylamino-phenyl)-vinyl]-1,3,3-trimethyl-3H-indolium. Application for determination of gold / Rastislav Serbin ... [et al.].
In: Journal of the Chinese Chemical Society. -- ISSN 0009-4536. -- vol. 56 (2009), s. 1168-1174.
[SERBIN, Rastislav - BAZEL, Yaroslav R. - TÖRÖK, Marcel - HAVEL, Ivan - BALOGH, Ioseph S. - KORMOSH, Zholt - HOLÉCZYOVÁ, Gabriela - ANDRUCH, Vasil]
- ADC20 Isolation and detection of steroids from human urine by molecularly imprinted solid-phase extraction and liquid chromatography / Reanata Gadzala-Kopciuch, Julia Ričanyova, Boguslav Buszewski.
In: Journal of Chromatography B. -- ISSN 1570-0232. -- vol. 877, no. 11-12 (2009), s. 1177-1184.
[GADZALA-KOPCIUCH, Renata - RIČANYOVÁ, Júlia - BUSZEWSKI, Boguslav]

- ADC21 Kinetics of cyanide binding as a probe of local stability/flexibility of cytochrome c / Rastislav Varhač ... [et al.]. -- Článok bol publikovaný v zborníku Structure and Stability of Biomacromolecules SSB 2009 : 6th interantional conference : 9.-11.september 2009, Košice, s. 85-86.
In: Biophysical Chemistry. -- ISSN 0301-4622. -- Vol. 144, iss. 1-2 (2009), p. 21-26.
[VARHAČ, Rastislav (30%) - TOMÁŠKOVÁ, Nataša (30%) - FABIAN, Marián (10%) - SEDLÁK, Erik (30%)]
- ADC22 Low-dimensional compounds containing cyano groups. XIX. Crystal structure, spectroscopic, thermal and magnetic properties of $\{[Cu(tn)_2]_3[Pt_4]_2\}[Pt(CN)_4]$ (tn=1,3-diaminopropane) complexes / Ivan Potočňák ... [et al.].
In: Inorganica Chimica Acta. -- ISSN 0020-1693. -- Vol. 362, iss. 11 (2009), p. 4152-4157.
[POTOČŇÁK, Ivan (30%) - VAVRA, Martin (30%) - ČIŽMÁR, Erik (25%) - DUŠEK, Michal (5%) - MÜLLER, Thomas (5%) - STEINBORN, Dirk (5%)]
- ADC23 Low-dimensional compounds containing cyano groups. XVIII. Two-dimensional network made of $[Cu(tmen)]_2+$ moieties (tmen=tetrametyletyléndiamine) connected by $[Pt(CN)_4]^{2-}$ anions with three different bridging cyano groups / Martin Vavra ... [et al.].
In: Inorganic Chemistry Communications. -- ISSN 1387-7003. -- Vol 12, iss. 5 (2009), p. 396-398.
[VAVRA, Martin (30%) - POTOČŇÁK, Ivan (30%) - KAJŇAKOVÁ, Marcela (15%) - ČIŽMÁR, Erik (15%) - FEHER, Alexander (10%)]
- ADC24 Low-dimensional compounds containing cyano groups XVII. Crystal structure, spectroscopic, thermal and magnetic properties of $[Cu(bmen)_2][Pt(CN)_4]$ (bmen=N,N'-dimetyletyléndiamine) / Ivan Potočňák ... [et al.].
In: Journal of Solid State Chemistry. -- ISSN 0022-4596. -- Vol. 182 (2009), p. 196-202.
[POTOČŇÁK, Ivan (25%) - VAVRA, Martin (25%) - ČIŽMÁR, Erik (10%) - KAJŇAKOVÁ, Marcela (10%) - RADVÁKOVÁ, Alena (10%) - STEINBORN, Dirk (5%) - ZVYAGIN, S.A. (5%) - WOSNITZA, Jochen (5%) - FEHER, Alexander (5%)]
- ADC25 Methods for the determination of adenosine triphosphate and other adenine nucleotides / S.V. Khlyntseva..
In: Journal of Analytical Chemistry. -- ISSN 1061-9348. -- Vol. 64, iis. 7 (2009), p. 657-673.
[KHLINTSEVA, Svetlana V. - BAZEL, Yaroslav R. - VISHNIKIN, Andriy - ANDRUCH, Vasil']
- ADC26 Nanosized composites of synthetic zeolites and silver iodide as potentially electrochemically active materials / Mária Reháková ... [et al.].
In: Journal of Inclusion Phenomena and Macrocyclic Chemistry. -- ISSN 0923-0750. -- (2009), DOI 10.1007/s10847-009-9647-1.
[REHÁKOVÁ, Mária (28%) - CASCIOLA, Mario (16%) - ČUVANOVÁ, Silvia (14%) - WADSTEN, Tommy (10%) - ŠÁLY, Vladimír (8%) - NAGYOVÁ, Stanislava (8%) - FORTUNOVÁ, Ľubica (8%) - SGANAPPA, Manolo (4%) - PACKA, Juraj (4%)]
- ADC27 One-pot synthesis of amino functionalized mesoporous silica materials: using simulations to understand transitions between different structures / Alessandro Patti ... [et al.].
In: Journal of Materials Chemistry. -- ISSN 0959-9428. -- vol. 19, iss. 6 (2009), p. 724-732.
[PATTI, Alessandro (25%) - MACKIE, Allan D. (25%) - ZELENÁK, Vladimír (25%) - SIPERSTEIN, Flor R. (25%)]
- ADC28 Platination of telomeric sequences and nuclease hypersensitive elements of human c-myc and PDGF-A promoters and their ability to form G-quadruplexes. / Viktor Víglašský..
In: FEBS Journal. -- ISSN 1742-464X. -- vol. 276, iss. 2 (2009), p. 401-409.
[VÍGLASKÝ, Viktor (100%)]
- ADC29 Polyanion hydrophobicity and protein basicity affect protein stability in protein-polyanion complexes / Erik Sedlák ... [et al.].
In: Biomacromolecules. -- ISSN 1525-7797. -- vol. 10, iss. 9 (2009), p. 2533-2538.
[SEDLÁK, Erik (50%) - FEDUNOVÁ, Diana (10%) - VESELÁ, V. (10%) - SEDLÁKOVÁ,

- Dagmar (10%) - ANTALÍK, Marián (20%)]
- ADC30 Potentiometric sensor for the indomethacin determination / Zholt Kormosh, Iryna Hunka, Yaroslav Bazel.
In: Materials Science & Engineering C-Biomimetic and Supramolecular Systems. -- ISSN 0928-4931. -- Vol. 29 (2009), iss. 3 Sp. iss., p. 1018-1022.
[KORMOSH, Zholt - HUNKA, Iryna - BAZEL, Yaroslav R.]
- ADC31 Sequential dissociation of subunits from bovine heart cytochrome c oxidase urea / Erik Sedlák, Neal C. Robinson.
In: Biochemistry. -- ISSN 0006-2960. -- vol. 48 (2009), p. 8143-8150.
[SEDLÁK, Erik (70%) - ROBINSON, Neal C. (30%)]
- ADC32 Spectrophotometric determination of [2-(2,6-dichloro-phenylamino)-phenyl]-acetic acid in pure form and in pharmaceuticals / Yaroslav Bazel ... [et al.]..
In: Spectrochimica Acta part A-Molecular and Biomolecular Spectroscopy. -- ISSN 1386-1425. -- vol. 74, no. 5 (2009), s. 1209-1214.
[BAZEL, Yaroslav R. - HUNKA, Iryna - KORMOSH, Zholt - ANDRUCH, Vasil']
- ADC33 Spectroscopic, structural and theoretical studies of novel, potentially cytotoxic 4-acridonecarboxamide imines / Zdenka Fröhlichová ... [et al.]..
In: Spectrochimica Acta Part A. -- ISSN 1386-1425. -- Vol. 73, iss. 2 (2009), p. 238-248.
[BEDLOVIČOVÁ, Zdenka - IMRICH, Ján - DANIHEL, Ivan - KRISTIAN, Pavol - BÖHM, Stanislav - SABOLOVÁ, Danica - KOŽURKOVÁ, Mária - HRITZOVÁ, Oľga - HORVÁTH, Branislav - BUŠOVÁ, Tatiana - KLIKA, Karel D.]
- ADC34 Surface-enhanced Raman spectroscopy on novel black silicon-based nanostructured surfaces / Ivan Talian ... [et al.]..
In: Journal of Raman Spectroscopy. -- ISSN 0377-0486. -- Vol. 40, iss. 8 (2009), p. 982-986.
[TALIAN, Ivan - MOGENSEN, Klaus Bo - ORIŇÁK, Andrej - KANIANSKY, Dušan - HÜBNER, Jörg]
- ADC35 Synthesis, biological and physicochemical properties of Zinc(II) salicylate and 5-chlorosalicylate complexes with theophylline and urea / Zuzana Bujdošová ... [et al.]..
In: Journal of Thermal Analysis and Calorimetry. -- ISSN 1388-6150. -- vol. 98, no. 1 (2009), s. 151-159.
[BUJDOŠOVÁ, Zuzana (60%) - GYÖRYOVÁ, Katarína (10%) - KOVÁŘOVÁ, Jana (10%) - HUDECOVÁ, Daniela (10%) - HALÁS, Ladislav (10%)]
- ADC36 Synthesis, crystal structures and spectroscopic properties of three Zn-cyclen-aminoacid complexes with new macrocyclic configurations / Z. Vargová ... [et al.]..
In: Inorganica Chimica Acta. -- ISSN 0020-1693. -- Vol. 362, iss. 10 (2009), p. 3860-3866.
[VARGOVÁ, Zuzana (60%) - GYEPES, Robert (20%) - ARABULI, Lili (5%) - GYÖRYOVÁ, Katarína (5%) - HERMANN, Petr (5%) - LUKEŠ, Ivan (5%)]
- ADC37 Synthesis, spectral, thermal and structural study of bis(2-bromobenzoato-0,0')-bis(methyl-3-pyridylcarbamate-N)-zinc(II). / Annamária Erdélyiová ... [et al.]..
In: Polyhedron. -- ISSN 0277-5387. -- Vol. 28, (2009), p. 131-137.
[KRAJNÍKOVÁ, Annamária - GYÖRYOVÁ, Katarína - GYEPES, Robert - HALÁS, Ladislav - KOVÁŘOVÁ, Jana]
- ADC38 Synthesis and properties of novel biologically interesting polycyclic 1,3,4-oxadiazoles containing acridine/acridone moieties / Zdenka Fröhlichová ... [et al.]..
In: Heterocycles. -- ISSN 0385-5414. -- Vol. 77, no. 2 (2009), p. 1019-1035.
[BEDLOVIČOVÁ, Zdenka - TOMAŠČIKOVÁ, Jana - IMRICH, Ján - KRISTIAN, Pavol - DANIHEL, Ivan - BÖHM, Stanislav - SABOLOVÁ, Danica - KOŽURKOVÁ, Mária - KLIKA, Karel D.]
- ADC39 Thermal behavior of brannerite ceramics and its natural analogue mineral brannerite / Vladimír Balek ... [et al.]..
In: Ceramics-Silikatv. -- ISSN 0862-5468. -- vol. 53, iss. 1 (2009), p. 9-14.

[BALEK, Vladimír (25%) - ZELENÁK, Vladimír (25%) - BENEŠ, Martin (25%) - ŠUBRT, Jan (25%)]

- ADC40 Three Co(III)-Fe(II) complexes based on hexacyanoferrates: syntheses, spectroscopic and structural characterizations / M. Matiková-Mařarová ... [et al.]..
In: *Inorganica Chimica Acta*. -- ISSN 0020-1693. -- Vol. 362, iss. 2 (2009), p. 443-448.
[MATIKOVÁ-MAŘAROVÁ, Miroslava (30%) - ČERNÁK, Juraj (30%) - MASSA, Werner (20%) - VARRET, Francois (20%)]
- ADC41 *Trypanosoma cruzi*: Antiproliferative effect of indole phytoalexins on intracellular amastigotes in vitro / Roman Mezencev ... [et al.]..
In: *Experimental Parasitology*. -- ISSN 0014-4894. -- vol. 122, iss. 1 (2009), p. 66-69.
[MEZENCEV, Roman (50%) - GALIZZI, Melina (20%) - KUTSCHY, Peter (15%) - DOCAMPO, Roberto]
- ADC42 Two different one-dimensional structural motifs in [catena-{Cu(tacn)}(2)Pd(CN)(4)]Br(2).[catena-Cu(tacn)Pd(CN)(4)](2).H(2)O (tacn is 1,4,7-triazacyclononane) / Juraj Kuchár, Juraj Černák..
In: *Acta Crystallographica Section C - Crystal Structure Communications*. -- ISSN 0108-2701. -- Vol. 65, iss. 7 (2009), p. m246-m249.
[KUCHÁR, Juraj - ČERNÁK, Juraj]

ADD - Scientific works in the domestic Current Contents periodicals (2)

- ADD1 Antioxidative effect of some hydroxy substituted aromatic bisimines / František Šeršeň, Martin Walko, Dušan Loos..
In: *General Physiology and Biophysics*. -- ISSN 0231-5882. -- roč. 28, iss. 2 (2009), s. 210-214.
[ŠERŠEŇ, František (40%) - WALKO, Martin (40%) - LOOS, Dušan (20%)]
- ADD2 The design, synthesis and anticancer activity of new nitrogen mustard derivatives of natural indole phytoalexin 1-methoxyspirobrassinol / R. Mezencev ... [et al.]..
In: *Neoplasma*. -- ISSN 0028-2685. -- Roč. 56, č. 4 (2009), s. 321-330.
[MEZENCEV, Roman - KUTSCHY, Peter - SALAYOVÁ, Aneta - UPDEGROVE, T. - MCDONALD, John]

ADE - Scientific works in the foreign non Current Contents periodicals (2)

- ADE1 An ion-selective sensor for assay of diclofenac in medicines / Zh.A.Kormosh, I.P.Hunka, Y.R.Bazel..
In: *Pharmaceutical Chemistry Journal*. -- ISSN 0091-150X. -- vol. 43, no. 7 (2009), s. 428-430.
[KORMOSH, Zholt - HUNKA, Iryna - BAZEL, Yaroslav R.]
- ADE2 Spectrophotometric determination of ketoprofen and its application in pharmaceutical analysis / Zholt Kormosh, Iryna Hunka, Yaroslav Basel..
In: *Acta Poloniae Pharmaceutica*. -- ISSN 0001-6837. -- vol. 66, no. 1 (2009), s. 3-9.
[KORMOSH, Zholt - HUNKA, Iryna - BAZEL, Yaroslav R.]

ADF - Scientific works in the domestic non Current Contents periodicals (4)

- ADF1 Elektrochemická polymerizácia pyrolu a štúdium elektrokatalytickej aktivity Ni/PPy vrstvy / Mária Filkusová, Renáta Oriňáková, Andrea Fedorková..
In: *Transfer inovácií*. -- ISSN 1337-7094. -- č. 15 (2009), s. 52-57.
[FILKUSOVÁ, Mária - ORIŇÁKOVÁ, Renáta - FEDORKOVÁ, Andrea]
- ADF2 Interakcie nízkomolekulárnych ligandov s DNA štruktúrami - potenciálny nástroj v protinádorovej terapii / R. Seliga, V. Víglaský, J. Mojiš..

- In: Acta chemotherapeutica : časopis Slovenskej chemoterapeutickej spoločnosti SLS. -- ISSN 1335-0579. -- Roč. 18, č. 1 (2009), s. 40-48.
[SELIGA, Róbert - VÍGLASKÝ, Viktor - MOJŽIŠ, Ján]
- ADF3 Study of polypyrrole film deposition on to iron particles and the effect of such coating on the compaction behaviour / Miriam Kupková ... [et al.]..
In: Manufacturing Engineering - Výrobné inžinierstvo. -- ISSN 1335-7972. -- roč. VIII, č. 4 (2009), s. 20-22, 31.
[KUPKOVÁ, Miriam - ORIŇÁKOVÁ, Renáta - ORIŇÁK, Andrej - FEDORKOVÁ, Andrea]
- ADF4 Štúdium funkcionality strieborných nanoštrukturovaných povrchov / Lenka Škantárová ... [et al.]..
In: Transfer inovácií. -- ISSN 1337-7094. -- č. 15 (2009), s. 80-85.
[ŠKANTÁROVÁ, Lenka - ORIŇÁKOVÁ, Renáta - ORIŇÁK, Andrej - TALIAN, Ivan]

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Slovak Speleological Society, Liptovský Mikuláš

Slovak cave administration, Liptovský Mikuláš

Slovak Museum of Nature Protection and Speleology, Liptovský Mikuláš

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Nyíregyházi Főiskola, Faculty of Sciences, Department of Geography, Hungary

Chernivtsi National University of Jury Fedkovich, Ukraine

Hungarian Academy of Sciences, North Hungarian Regional Department of the Centre for Regional Studies, Miskolc, Hungary

University of Ostrava, Faculty of Science, Department of Human Geography and Regional Development, Czech Republic

Selected Research Projects

Areas with higher species diversity: what is the influence of stream habitat heterogeneity on ichthyofauna diversity

APVV - 0154 - 07

(Dušan Barabas, 09/2008 – 12/2010)

Lets learn from each other

HUSK – 0801/1.6.1/0003

(Dušan Barabas, 09/2009 – 12/2010)

Preparation of the new study programme in english language: "Geography of societies in transformation"

KEGA – 3/7403/09

(Marián Kulla, 09/2009 – 12/2011)

Current State And Perspectives Of The Development Of Human-Geographic Structures In The Košice Self – Governing Region

VEGA 1/0088/08

(Marián Kulla, 01/2008 – 12/2010)

Development of Microregional Rural Structures of Slovakia with Local and Regional Self-government Support

VEGA 1/0175/09

(Peter Spišiak, 01/2009 – 12/2011)

The morphology and genesis of precenozoic cave systems in the Western Carpathes

VEGA 1/0161/09

(Zdenko Hochmuth, 01/2009 – 12/2011)

Selected Results

APVV-0154-07 (Barabas): Hydrological systems of Tisa river basin is known to hold number of endangered species of fish. Habitats of model stream in East Slovakia will be monitored and the population ecology and population genetic parameters of dominant fish species will be evaluated. The determination of ichthyofauna and benthos habitat use, and their relation to the environment parameters will create the sound basis for relevant autoecological characteristics investigation of individual species and it will be used for river ecosystem management. (Barabas, D., Frániková, J., *Geographia Cassoviensis* 3 (2009) 17-23).

KEGA 3/7403/09 (Kulla): The evaluation period concerned research on the existing study programmes on foreign universities. In the following step, we analysed the structure of the human geography programme. The analysis was focused on the structure of the geography modules and the relationship with transition societies. For example, we searched for departments where the education involves post-socialist countries. A questionnaire was set up in order to assess the interest of students in undertaking study of human geography in Slovakia. The aim is to identify those features of study which are attractive for the foreign students and which could be implemented into the study programme.

VEGA 1/0088/08 (Kulla): Our research concerned human geographic structures of Kosický kraj (county) in three study areas Medzibodrožie, Microregion Hornád a Olšavský microregion. We applied behavioral methods primarily and focused the research on the investigation of the quality of life. The results show variability of the quality of life in the surroundings of Košice (Microregion Hornád) and in the area of Medzibodrožie. It is mostly due to the number of available jobs, the quality of infrastructure, and the availability of basic services in the municipalities. The field survey of the study areas identified recreational zones, the most important business estates, but also demographic trends, as it is a region of a significant percentage of Roma population (Kulla, M., Dická, J., 2009, *Acta Universitatis Prešovensis, Folia Oecologica* 2, Prešov (2009) 173-185; Kandráčová V., Kulla, M., Nestorová – Dická, J., *Geographia cassoviensis*, r.3, č. 2. Ústav geografie PF UPJŠ Košice (2009)).

VEGA 1/0175/09 (Spišiak): The quality of life of population in the hinterland of the Košice city – the microregion of Hornád – has been explored. The settlement system of Slovakia – in terms of urban and rural systems – the changes and development in the postsocialist transformation period, compared to the neighbouring countries of the Czech Republic and Hungary was presented at the conference EUGEO 2009 in Bratislava (Spišiak, P., Ira V., Podolák, P., In: Minarovič, M., et al.: Monografia kultúrno-historickej a spoločenskej topografie Mikroregión zdroje Bielych Karpát. REC, Slovensko, ISBN 978-80-89320-02-8, s.93-111; Spišiak, P., Némethová, J., AFRNUC, No. 53, Univerzita Komenského Bratislava, (2009) 139-148).

VEGA 1/0161/09 (Hochmuth): The project is geared to basic speleologic research of caves of the Slovak Karst, the High Tatras and the Belasné Tatras, mainly Skalístý brook located on the Jasovská plateau in the Slovak Karst. The development of cave area and the origin of sediments in it. The relation of endokarst and exokarst forms on the plateaux of the Slovak Karst has been addressed as well. The relevant research outcomes were presented at the conference research, use and protection of caves in Smolenice in november 2009 (Barabas, D., Gallay M., Labunová, A., Aragonit 14, 2. Slovenská speleologická spoločnosť, Liptovský Mikuláš, (2009) s. 165; Hochmuth, Z., Aragonit : časopis Správy slovenských jaskýň. Roč. 14, č. 2, s. 168-169. ISSN 1335-213X (2009)).

Selected Publications

ADF - Scientific works in the domestic non Current Contents periodicals (10)

- ADF1 Assessment of the quality of digital terrain models with global and local approaches: a case study using fine spatial resolution data from alternative sources / Michal Gallay..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 60-68.
[GALLAY, Michal (100%)]
- ADF2 Dispartia priestorového rozšírenia akumulčných foriem tokov Bodva a Chotárneho potoka / Dušan Barabas, Jana Frániková..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 17-23.
[BARABAS, Dušan (70%) - FRÁNIKOVÁ, Jana (30%)]
- ADF3 Dynamika pracovnej migrácie obyvateľstva okresu Košice okolie v rokoch 1961-2001 / Viktória Kandráčová..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 69-73.
[KANDRÁČOVÁ, Viktória]
- ADF4 Efektívny rozvoj lokálnych samospráv v Slovenskej republike / Stela Lovacká..
In: Acta Geographica Universitatis Comenianae. -- ISSN 0231-715X. -- Č. 53 (2009), s. 107-121.
[CSACHOVÁ, Stela]
- ADF5 Funkčné typy obcí Mikroregiónu Hornád v transformačnom období 1991-2007 / Viktória Kandráčová, Marián Kulla, Janetta Nestorová-Dická..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 74-80.
[KANDRÁČOVÁ, Viktória (40%) - KULLA, Marián (30%) - NESTOROVÁ-DICKÁ, Janetta (30%)]
- ADF6 Hospodárske pomery a infraštruktúrna vybavenosť v obciach Medzibodroží / Marián Kulla, Janetta Nestorová-Dická..
In: Acta Universitatis Prešoviensis Prírodné vedy Folia Oecologica 2 : Čiaskové analýzy a vybrané propozície slovenskej časti krajiny Medzibodrožia. -- Prešov : Prešovská univerzita, 2009. -- ISSN 1338-080X. -- S. 173-185.
[KULLA, Marián (50%) - NESTOROVÁ-DICKÁ, Janetta (50%)]

- ADF7 Potravinárska výroba v okrese Nitra a trendy jej rozvoja / Peter Spišiak, Jana Némethová..
In: Acta Geographica Universitatis Comenianae. -- ISSN 0231-715X. -- Č. 53 (2009), s. 139-148.
[SPIŠIAK, Peter (80%) - NÉMETHOVÁ, Jana (20%)]
- ADF8 Príspevok ku štúdiu genézy a stratigrafie eolických pieskov južnej časti Východoslovenskej nížiny / Ján Košťálik..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 81-91.
[KOŠŤÁLIK, Ján]
- ADF9 Sídello-geografický potenciál Medzibodrožia / Janetta Nestorová-Dická, Marián Kulla..
In: Acta Universitatis Prešovensis Prírodné vedy Folia Oecologica 2 : Čiaskové analýzy a vybrané propozície slovenskej časti krajiny Medzibodrožia. -- Prešov : Prešovská univerzita, 2009. -- ISSN 1338-080X. -- S. 153-172.
[NESTOROVÁ-DICKÁ, Janetta (50%) - KULLA, Marián (50%)]
- ADF10 Vývojové etapy európskych miest (procesy utvárajúce a formujúce európske mestá) / Janetta Nestorová-Dická, Stela Lovacká..
In: Geographia Cassoviensis. -- ISSN 1337-6748. -- Roč. 3, č. 2 (2009), s. 127-132.
[NESTOROVÁ-DICKÁ, Janetta (50%) - CSACHOVÁ, Stela (50%)]

AEC - Scientific works in the foreign conference proceedings, monographs (3)

- AEC1 Priemysel Dolného Spiša s dôrazom na podnik Embraco Slovakia Spišská nová Ves / Peter Spišiak, Marián Kulla..
In: Geographia Moravica 1 : zborník prací k šedesátinám doc. RNDr. Václava Touška. -- Olomouc : Univerzita Palackého, 2009. -- ISBN 9788024424644. -- S. 71-83.
[SPIŠIAK, Peter (50%) - KULLA, Marián (50%)]
- AEC2 Prírodné pomery : Fyzicko-geografické pomery Málinca a okolia / Natural conditions : physiogeographical conditions of Málinec and outskirts..
In: Málinec : regionálna monografia. -- Málinec : Obecný úrad v Málinci, 2009. -- ISBN 9788089183579. -- S. 7-10.
[KOŠŤÁLIK, Ján]
- AEC3 Prírodné pomery : Makroštruktúra Lučensko-košickej zníženiny / Ján Košťálik..
In: Málinec : regionálna monografia. -- Málinec : Obecný úrad v Málinci, 2009. -- ISBN 9788089183579. -- S. 11-25.
[KOŠŤÁLIK, Ján]

AED - Scientific works in the domestic conference proceedings, monographs (5)

- AED1 Erózne javy v povodí Bodvy / Dušan Barabas.. -- Recenzenti: Aristid Mošanský, Ľudovít Dostál, Milan Barlog.
In: Natura Carpatica : zborník východoslovenského múzea : prírodné vedy 36 (1995). -- Košice : Východoslovenské múzeum, 1995. -- ISBN 809670723X. -- S. 9-14.
[BARABAS, Dušan (100%)]
- AED2 Geomorfologické pomery a reliéf / Z. Hochmuth..
In: Monografia mesta Ružomberok. -- Banská Bystrica : Štúdio HARMONY, 2009. -- ISBN 9788089151226. -- S. 14-15.
[HOCHMUTH, Zdenko]
- AED3 Jaskyne a kras v okolí mesta / Z. Hochmuth..
In: Monografia mesta Ružomberok. -- Banská Bystrica : Štúdio HARMONY, 2009. -- ISBN 9788089151226. -- S. 16-17.
[HOCHMUTH, Zdenko]
- AED4 Petrografia a stratigrafia / Z. Hochmuth..

In: Monografia mesta Ružomberok. -- Banská Bystrica : Štúdio HARMONY, 2009. -- ISBN 9788089151226. -- S. 10-13.
[HOCHMUTH, Zdenko]

AED5 Pôdy / Z. Hochmuth..

In: Monografia mesta Ružomberok. -- Banská Bystrica : Štúdio HARMONY, 2009. -- ISBN 9788089151226. -- S. 18.
[HOCHMUTH, Zdenko]

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T-Systems, Ltd.

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University of Bonn, Germany

University of Malaga, Spain

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European Structural Fund Projects

Centre of Excellence in Computer Sciences and Knowledge Systems

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Matej Bel University in Banská Bystrica
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Selected Research Projects

Fusion of interpolation and approximation.

VEGA 1/4003/07

(Csaba Török, 01/2008 – 12/2009)

Mathematical Support of Experimental and Theoretical Research Conducted by JINR

JINR 09-6-1060-2008/2010

(Csaba Török, 09/2008 – 12/2010)

Combinatorial structures and complexity of algorithms

VEGA 1/0035/09

(Viliam Geffert, 01/2009 – 12/2011)

Methods of analysis of structured and/or unstructured data with uncertainly and their using in intelligent search

VEGA 1/0131/09

(Stanislav Krajči, 01/2009 – 12/2011)

Selected Results

VEGA 1/4003/07 (Török): The project proposed a new approach to parametric piecewise approximation of noisy data with complex structure using a model, based on a fusion of interpolation and approximation with spline properties. Thanks to reparametrization and the principle of shared parameterst the model possesses relevant asymptotic properties. Tests showed that the approach can be applied to real data from diverse scientific and technical areas. (A. Matejčiková, Cs. Török, Communication of JINR, Dubna, 2008, E11-2008-205, pp. 1-8; Cs. Török, Forum Statisticum Slovacum, 7/2009, Bratislava, pp.188-193).

VEGA 1/0131/09 (Krajči): A model of user preferences for recommender systems was designed and researched. A translation of relational ontology queries to classical relational database ones was considered. A description logic with concept instance ordering and top-k restriction was researched and proposed model was implemented. The model of user preferences was fuzzified too. Fuzzy concept lattices and their construction by means of so-called proto-fuzzy concepts were researched. The research of concept lattices from the categorical point of view continues, namely by generalization of Chu correspondences (Křídlo O., Krajči S., In: Proceedings IFSA/EUSFLAT 2009, Lisabon, s. 1252-1258).

VEGA 1/0035/09 (Geffert): Combinatorial structures and complexity of algorithms: We have devised an algorithm for asymptotically efficient k-way merging. Given an array A containing k sorted subsequences A_1, \dots, A_k of respective lengths n_1, \dots, n_k , where $\sum_{k=1}^k n_i = n$, our algorithm merges A in-place, into a single sorted sequence, performing $\lceil \lg k \rceil \cdot n + o(n)$ element comparisons and $3 \cdot n + o(n)$ element moves. That is, our algorithm runs in linear time, with the number of moves independent of k, the number of input subsequences (Geffert V., Gajdoš J., Multiway in-place merging, Proc.of FCT 2009 (Fundamentals of Computation Theory), Lecture Notes in Computer Science 5699, Springer-Verlag, 2009, pp.133-144).

Selected Publications

ADC - Scientific works in the foreign Current Contents periodicals (4)

ADC1 A note on the lower bound of centralized radio broadcasting for planar reachability graphs / F. Galčík..

- In: Discrete Applied Mathematics. -- ISSN 0166-218X. -- Vol. 157, iss. 4 (2009), p. 853-857.
[GALČÍK, František (100%)]
- ADC2 Constructive decomposition of a function of two variables as a sum of functions of one variable / Eva Miliczká.
In: Proceedings of the American Mathematical Society. -- ISSN 0002-9939. -- Vol. 137, iss. 2 (2009), p. 607-614.
[MILICZKÁ, Eva (100%)]
- ADC3 Hyper-minimizing minimized deterministic finite state automata / Viliam Geffert ... [et al.].
In: RAIRO-Theoretical Informatics and Applications. -- ISSN 0988-3754. -- Vol. 43, iss. 1 (2009), p. 69-94.
[BADR, Andrew (33,3%) - GEFFERT, Viliam (33,3%) - SHIPMAN, Ian (33,3%)]
- ADC4 Polynomial reduction of time-space scheduling to time scheduling / J. Studenovský.
In: Discrete Applied Mathematics. -- ISSN 0166-218X. -- Vol. 157, iss. 7 (2009), p. 1364-1378.
[STUDENOVSKÝ, Jozef (100%)]

ADD - Scientific works in the domestic Current Contents periodicals (3)

- ADD1 A model of user preference learning for content-based recommendr systems / Tomáš Horváth..
In: Computing and Informatics. -- ISSN 1335-9150. -- Vol. 28, iss. 4 (2009), p. 453-881.
[HORVÁTH, Tomáš]
- ADD2 On supporting wide range of attribute types for top-k search / Peter Gurský, René Pázman, Peter Vojtáš..
In: Computing and Informatics. -- ISSN 1335-9150. -- Vol. 28, iss. 4 (2009), p. 483-513.
[GURSKÝ, Peter (33%) - PÁZMAN, René (33%) - VOJTÁŠ, Peter (33%)]
- ADD3 User preference web search - experiments with a system connecting web and user / Peter Gurský ... [et al.].
In: Computing and Informatics. -- ISSN 1335-9150. -- Vol. 28, iss. 4 (2009), p. 515-553.
[GURSKÝ, Peter - HORVÁTH, Tomáš - JIRÁSEK, Jozef - KRAJČI, Stanislav - NOVOTNÝ, Róbert - KOLODZIEJOVÁ, Jana - VANEKOVÁ, Veronika - VOJTÁŠ, Peter]

ADE - Scientific works in the foreign non Current Contents periodicals (4)

- ADE1 A note on the Path Kernel Conjecture / Peter Katrenič, Gabriel Semanišin..
In: Discrete Mathematics. -- ISSN 0012-365X. -- Vol. 309 (2009), p. 2551-2554.
[KATRENIČ, Peter (50%) - SEMANIŠIN, Gabriel (50%)]
- ADE2 Čiastkové výsledky výskumu úrovne psychodidaktických kompetencií učiteľov / Ján Bajtoš ... [et al.]. -- Článok bol publikovaný aj v zborníku Modernizace vysokoškolské výuky technických predmětů : sborník příspěvku z mezinárodní vědecké konference, konané 1. dubna 2009. Hradec Králové : Gaudeamus, 2009. ISBN 978-80-7041-611-2, s. 16-21..
In: Media4u Magazine. -- ISSN 1214-9187. -- X1 (2009), s. 14-18.
[BAJTOŠ, Ján (25%) - ŠNAJDER, Ľubomír (25%) - OROSOVÁ, Renáta (25%) - KIREŠ, Marián (25%)]
- ADE3 Ontology engineering relationally / Jaroslav Pokorný, Jana Pribolová, Peter Vojtáš.. -- Článok bol publikovaný v zborníku ECJ 2009 : proceedings of the 19th European-Japanese conference on Information modelling and knowledge bases : 1.-5.jún, Maribor(Slovensko).
In: Tech. Report. -- Č. 2 (2009), s. 1-20.
[POKORNÝ, Jaroslav - KOLODZIEJOVÁ, Jana - VOJTÁŠ, Peter]
- ADE4 On universal graphs for hom-properties / Peter Mihók, Jozef Miškuf, Gabriel Semanišin..
In: Discussiones Mathematicae Graph Theory. -- ISSN 1234-3099. -- vol. 29, iss. 2 (2009), p.

401-409.

[MIHÓK, Peter (33,3%) - MIŠKUF, Jozef (33,3%) - SEMANIŠIN, Gabriel (33,3%)]

ADF - Scientific works in the domestic non Current Contents periodicals (3)

ADF1 Diskrétna transformácia 3D dát / Imrich Szabó..

In: Forum Statisticum Slovaca. -- ISSN 1336-7420. -- Roč. V, č. 7 (2009), s. 169-175.

[SZABÓ, Imrich]

ADF2 Probabilistic neural networks application in manufacturing context / Štefánia Gallová..

In: Transactions of the Universities of Košice. -- ISSN 1335-2334. -- Č. 1 (2009), s. 1-5.

[GALLOVÁ, Štefánia]

ADF3 Úsekové vyhladzovanie pomocou spoločných parametrov / Csaba Török..

In: Forum Statisticum Slovaca. -- ISSN 1336-7420. -- Roč. V, č. 7 (2009), s. 188-193.

[TÖRÖK, Csaba]

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University of Washington, Seattle, USA,
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Vanderbilt University, Nashville, USA.

Selected Research Projects

Embeddings, colourings and labellings of graphs.

APVV-0007-07

(Stanislav Jendroľ, 02/2008 – 12/2010)

Toeplitz operators and their applications

VEGA 2/0097/08

(Ondrej Hutník, 01/2008 – 12/2010)

Risk management in nonlife insurance by European Union Guideline SOLVENCY II

VEGA 1/0724/08

(Valéria Skřivánková, 01/2008 – 12/2010)

Set-theoretic methods in topology and analysis

VEGA 1/0032/09

(Lev Bukovský, 01/2009 – 12/2011)

Analysis of some real function classes with respect to generalizations of continuity

VEGA 2/0023/09

(Jozef Doboš, 01/2009 – 12/2011)

Improving quality and increasing the effectivity of small and medium-sized enterprises by an application of methods for maximizing business success

VMSP-P-0116-09/3

(Roman Soták, 01/2009 – 12/2011)

Selected Results

APVV-0007-07 (Jendrol’): A sequence $r_1 r_2 \dots r_{2n}$ such that $r_i = r_{n+i}$ for all $1 \leq i \leq n$, is called a repetition. A sequence S is called non-repetitive if no subsequence of consecutive terms of S is a repetition. If G is a plane graph, a facial non-repetitive edge-colouring of G is an edge-colouring such that any facial trail is non-repetitive. We denote $p(G)$ the minimum number of colours of a facial non-repetitive edge-colouring of G . We have proved that $p(G) \leq 8$ for any plane graph G . We also get better upper bounds for special plane graphs (Havet F., Jendrol’ S., Soták R., Škrabul’áková E., J. Graph Theory, DOI:10.1002/jgt.20488, in press).

APVV-SK-SI-0007-08 (Madaras): A fullerene graph is a planar cubic graph whose all faces are pentagonal and hexagonal. The structure of cyclic edge-cuts of fullerene graphs of sizes at most 6 is known. In the paper we study cyclic 7-edge connectivity of fullerene graphs, distinguishing between degenerate and non-degenerate cyclic edge-cuts, regarding the arrangement of the 12 pentagons. We prove that if there exists a non-degenerate cyclic 7-edge-cut in a fullerene graph, then the graph is a nanotube unless it is one of the two exceptions presented. We determined that there are 57 configurations of degenerate cyclic 7-edge-cuts, and we listed all of them (Kardoš F., Krnc M., Lužar B., Škrekovski R., Journal of Mathematical Chemistry 47 (2010) 771-789).

VEGA 02/0097/08 (Hutník): We described a structure of the space of wavelet transforms. Using this result we proved a representation theorem for the Calderón-Toeplitz operators whose symbols depends only on imaginary part of complex number. (Hutník O., Integral Equations Operator Theory 63(1) (2009) 29-46).

Selected Publications

ADC - Scientific works in the foreign Current Contents periodicals (16)

- ADC1 A general upper bound for the cyclic chromatic number of 3-connected plane graphs / Hikoe Enomoto, Mirko Horňák.
In: Journal of Graph Theory. -- ISSN 0364-9024. -- Vol. 62, iss. 1 (2009), p. 1-25.
[ENOMOTO, Hikoe (50%) - HORŇÁK, Mirko (50%)]
- ADC2 Backbone colorings and generalized mycielski graphs / Jozef Miškuf, Riste Škrekovski, Martin Tancer..
In: SIAM Journal on Discrete Mathematics. -- ISSN 0895-4801. -- vol. 23, iss. 2 (2009) p. 1063-1070.
[MIŠKUF, Jozef (33,3%) - ŠKREKOVSKI, Riste (33,3%) - TANCER, Martin (33,3%)]

- ADC3 Congruencelifting of semilattice diagrams / Miroslav Ploščica..
In: International Journal of Algebra and Computation. -- ISSN 0218-0967. -- vol. 19, no. 7 (2009), s. 911-924.
[PLOŠČICA, Miroslav]
- ADC4 Fullerene graphs have exponentially many perfect matchings / František Kardoš ... [et al.]..
In: Journal of Mathematical Chemistry. -- ISSN 0259-9791. -- Vol. 46, iss. 2 (2009), p. 443-447.
[KARDOŠ, František (25%) - KRÁL, Daniel (25%) - MIŠKUF, Jozef (25%) - SERENI, Jean-Sébastien (25%)]
- ADC5 Gender specific trends in alcohol use: cross-cultural comparison from 1998 to 2006 in 24 countries and regions / Bruce G. Simons-Morton ... [et al.].. -- Collaboration : HBSC Risk Behaviour Focus Group.
In: International Journal of Public Health. -- ISSN 1661-8556. -- Vol. 54, suppl. 2 (2009), p. S199-S208.
[SIMONS-MORTON, Bruce G. - ŽEŽULA, Ivan - KOLARČIK, Peter]
- ADC6 Long cycles in fullerene graphs / Rok, Erman, František Kardoš, Jozef Miškuf..
In: Journal of Mathematical Chemistry. -- ISSN 0259-9791. -- Vol. 46, iss. 4 (2009), p. 1103-1111.
[ERMAN, Rok (33,3%) - KARDOŠ, František (33,3%) - MIŠKUF, Jozef]
- ADC7 Matchings and nonrainbow colorings / Zdeněk Dvořák ... [et al.]..
In: SIAM Journal on Discrete Mathematics. -- ISSN 0895-4801. -- vol. 23, iss. 1 (2009) p. 344-348.
[DVOŘÁK, Zdeněk (25%) - JENDROĽ, Stanislav (25%) - KRÁL, Daniel (25%) - PAP, Gyula (25%)]
- ADC8 On a certain class of submeasures based on triangular norms / Ondrej Hutník, Radko Mesiar..
In: International Journal of Uncertainty, Fuzziness and Knowledge-based systems. -- ISSN 0218-4885. -- Vol. 17, iss. 3 (2009), p. 297-316.
[HUTNÍK, Ondrej (50%) - MESIAR, Radko (50%)]
- ADC9 On the complexity of the Shapley-Scarf economy with several types of goods / Katarína Cechlárová..
In: Kybernetika. -- ISSN 0023-5954. -- Roč. 45, č. 5 (2009), s. 689-700.
[CECHLÁROVÁ, Katarína]
- ADC10 On Toeplitz-type operators related to wavelets / Ondrej Hutník..
In: Integral Equations and Operator Theory. -- ISSN 0378-620X. -- vol. 63, iss. 1 (2009) p. 29-46.
[HUTNÍK, Ondrej (100%)]
- ADC11 On vector integral inequalities / Ján Haluška, Ondrej Hutník..
In: Mediterranean Journal of Mathematics. -- ISSN 1660-5446. -- vol. 6, iss. 1 (2009) p. 105-124.
[HALUŠKA, Ján (50%) - HUTNÍK, Ondrej (50%)]
- ADC12 Rainbow faces in edge colored plane graphs / Stanislav Jendroľ... [et al.].. -- Článok bol publikovaný aj ako abstrakt v zborníku 6th Slovenian International Conference on Graph Theory Bled'07 : abstracts : Bled, Slovenia: 24-30 June 2007, s. 68..
In: Journal of Graph Theory. -- ISSN 0364-9024. -- Vol. 62, iss. 1 (2009), p. 84-99.
[JENDROĽ, Stanislav - MIŠKUF, Jozef - SOTÁK, Roman - ŠKRABUĽÁKOVÁ, Erika]
- ADC13 Socioeconomic indicators and ethnicity as determinants of regional mortality rates in Slovakia / Katarína Rosicova ... [et al.]..
In: International Journal of Public Health. -- ISSN 1661-8556. -- Vol. 54, is. 4 (2009), s. 274-282.
[ROSIČOVÁ, Katarína - MADARASOVÁ GECKOVÁ, Andrea - DIJK VAN, Jitse P. -

ROSIČ, Martin - ŽEŽULA, Ivan - GROOTHOFF, Johan W.]

- ADC14 Socio-economic inequality in multiple health complaints among adolescents - international comparative study 37 countries / Bjorn E. Holstein ... [et al.].. -- Collaborations : HBSC Social Inequalities Focus Group.
In: International Journal of Public Health. -- ISSN 1661-8556. -- Vol. 54, suppl. 2 (2009), s. S260-S270.
[HOLSTEIN, Bjorn E. - CURRIE, Candace - BOYCE, Will - DAMSGAARD, Mogens T. - GOBINA, Inese - KOKONYEI, Gyongyi - HETLAND, Jorn - LOOZE DE, Margaretha - RICHTER, Matthias - DUE, Pernille - MADARASOVÁ GECKOVÁ, Andrea (5%) - KOLARČIK, Peter - DIJK VAN, Jitse P. - ŽEŽULA, Ivan]
- ADC15 Some special functions identities arising from commuting operators / Mária Hutníková, Ondrej Hutník..
In: Reports on Mathematical Physics. -- ISSN 0034-4877. -- vol. 63, iss. 2 (2009), p. 251-262.
[HUTNÍKOVÁ, Mária (50%) - HUTNÍK, Ondrej (50%)]
- ADC16 The Fubini theorem for bornological product measures / Ján Haluška, Ondrej Hutník..
In: Results in Mathematics. -- ISSN 1422-6383. -- Vol. 54, iss. 1-2 (2009), 65-73.
[HALUŠKA, Ján (50%) - HUTNÍK, Ondrej (50%)]

ADE - Scientific works in the foreign non Current Contents periodicals (18)

- ADE1 A construction of supermagic graphs / Jaroslav Ivančo.. -- Článok vyšiel aj ako abstrakt v zborníku Fifth International Workshop on Graph Labelings : abstracts : 7.-10.január 2009, Krishnankoil, s. 3.
In: AKCE International Journal of Graphs and Combinatorics. -- ISSN 0972-8600. -- vol. 6, iss. 1 (2009), p. 91-102.
[IVANČO, Jaroslav (100%)]
- ADE2 Aktívne osvojovanie matematických poznatkov pomocou interaktívnych učebných materiálov. / Stanislav Lukáč, Radovan Engel..
In: Matematika fyzika informatika : časopis pro výuku na základných a středních školách. -- ISSN 1210-1761. -- roč. 18, č. 8 (2009), s. 488-497.
[LUKÁČ, Stanislav (50%) - ENGEL, Radovan (50%)]
- ADE3 A note on the Path Kernel Conjecture / Peter Katrenič, Gabriel Semanišin..
In: Discrete Mathematics. -- ISSN 0012-365X. -- Vol. 309 (2009), p. 2551-2554.
[KATRENIČ, Peter (50%) - SEMANIŠIN, Gabriel (50%)]
- ADE4 Approximate continuity and topological Boolean algebras / Ján Haluška, Ondrej Hutník..
In: Analysis. -- ISSN 0174-4747. -- Vol. 29, iss. 1 (2009), p. 17-27.
[HALUŠKA, Ján (50%) - HUTNÍK, Ondrej (50%)]
- ADE5 Colouring vertices of plane graphs under restrictions given faces / Július Czap, Stanislav Jendroľ..
In: Discussiones Mathematicae Graph Theory. -- ISSN 1234-3099. -- vol. 29 (2009), s. 521-543.
[CZAP, Július - JENDROĽ, Stanislav]
- ADE6 Convexities of partial monounary algebras / D. Jakubíková-Studenovská..
In: Algebra Universalis. -- ISSN 0002-5240. -- Vol. 60 (2009), p. 125-143.
[JAKUBÍKOVÁ-STUDENOVSKÁ, Danica (100%)]
- ADE7 Decomposition of bipartite graphs into closed trails / Sylwia Cichacz, Mirko Hornák.. -- Článok bol publikovaný aj ako abstrakt v zborníku Graphs 2007 : abstracts : Czech-Slovak Graph Theory Conference : June 11-15, 2007, Hradec nad Moravicí, s. 18.
In: Czechoslovak Mathematical Journal. -- ISSN 0011-4642. -- Roč. 59, č. 134 (2009), s. 129-144.

- [CICHACZ, Sylwia (50%) - HORŇÁK, Mirko (50%)]
- ADE8 Edge irregular total labellings for graphs of linear size / Stephan Brandt, Jozef Miškuf, Dieter Rautenbach..
In: Discrete Mathematics. -- ISSN 0012-365X. -- Vol. 309, iss. 12 (2009), p. 3786-3792.
[BRANDT, Stephan (33,3%) - MIŠKUF, Jozef (33,3%) - RAUTENBACH, Dieter (33,3%)]
- ADE9 Lattice of quasiorders of monounary algebras / D. Jakubiková-Studenovská..
In: Miskolc Mathematical Notes. -- ISSN 1787-2405. -- Vol. 10, iss. 1 (2009), p. 41-48.
[JAKUBÍKOVÁ-STUDENOVSKÁ, Danica (100%)]
- ADE10 Maximum vertex and face degree of oblique graphs / František Kardoš, Jozef Muškuf..
In: Discrete Mathematics. -- ISSN 0012-365X. -- Vol. 309, iss. 15 (2009), p. 4942-4948.
[KARDOŠ, František (50%) - MIŠKUF, J. (50%)]
- ADE11 On bounded nonoscillatory solutions of third-order nonlinear differential equations / Ivan Mojsej, Alena Tartal'ová..
Článok bol publikovaný ako samostatný preprint vydaný Univerzitou Pavla Jozefa Šafárika v Košiciach, 2009. -- ISBN (brož.).
In: Central European Journal of Mathematics. -- ISSN 1895-1074. -- Vol. 7, iss. 4 (2009), p. 717-724.
[MOJSEJ, Ivan (50%) - TARTAL'OVÁ, Alena (50%)]
- ADE12 On local structure of 1-planar graphs of minimum degree 5 and girth 4 / Dávid Hudák, Tomáš Madaras..
In: Discussiones Mathematicae Graph Theory. -- ISSN 1234-3099. -- vol. 29, no. 2 (2009), p. 385-400.
[HUDÁK, Dávid (50%) - MADARAS, Tomáš (50%)]
- ADE13 On multivariate Gaussian copulas / Ivan Žežula..
In: Journal of Statistical Planning and Inference. -- ISSN 0378-3758. -- vol. 139, iss. 11 (2009), p. 3942-3946.
[ŽEŽULA, Ivan (100%)]
- ADE14 On the existence of regular supermagic graphs / Jaroslav Ivančo, Petr Kovář, Andrea Semaničová-Feňovčíková..
In: The Journal of Combinatorial Mathematics and Combinatorial Computing. -- ISSN 0835-3026. -- Vol. 71 (2009), s. 49-64.
[IVANČO, Jaroslav (33,3%) - KOVÁŘ, Petr (33,3%) - SEMANIČOVÁ-FEŇOVČÍKOVÁ, Andrea (33,3%)]
- ADE15 On universal graphs for hom-properties / Peter Mihók, Jozef Miškuf, Gabriel Semanišin..
In: Discussiones Mathematicae Graph Theory. -- ISSN 1234-3099. -- vol. 29, iss. 2 (2009), p. 401-409.
[MIHÓK, Peter (33,3%) - MIŠKUF, Jozef (33,3%) - SEMANIŠIN, Gabriel (33,3%)]
- ADE16 Reforma matematického vzdelávania a rozvíjanie kľúčových kompetencií / Jozef Sekerák..
In: Učiteľ matematiky. -- ISSN 1210-9037. -- Roč. 17, č. 2 (70) (2009), s. 104-117.
[SEKERÁK, Jozef (100%)]
- ADE17 The maximum likelihood estimators in the growth curve model with serial covariance structure / Daniel Klein, Ivan Žežula..
In: Journal of Statistical Planning and Inference. -- ISSN 0378-3758. -- vol. 139, iss. 9 (2009), p. 3270-3276.
[KLEIN, Daniel (50%) - ŽEŽULA, Ivan (50%)]
- ADE18 Total labelings, irregularity strenghts and colourings / Stanislav Jendrol'..
Článok bol publikovaný aj ako abstrakt v zborníku Fifth International Workshop on Graph Labelings : abstracts : 7.-10.január 2009, Krishnankoil, s. 3.
In: AKCE International Journal of Graphs and Combinatorics. -- ISSN 0972-8600. -- vol. 6, iss. 1 (2009), p. 219-227.
[JENDROL', Stanislav (100%)]

ADF - Scientific works in the domestic non Current Contents periodicals (4)

- ADF1 Boundedness and oscillation of third order neutral differential equations / Božena Mihalíková, Eva Kostiková.
In: Tatra Mountains Mathematical Publications. -- ISSN 1201-3195. -- roč. 43 (2009), s. 137-144.
[MIHALÍKOVÁ, Božena (50%) - KOSTIKOVA, Eva (50%)]
- ADF2 Integrálne súčty / Jozef Doboš.
In: Obzory matematiky, fyziky a informatiky. -- ISSN 1335-4981. -- Roč. 38, č. 1 (2009), s. 13-20.
[DOBOŠ, Jozef (100%)]
- ADF3 Iterative separation in distributive congruence lattice / Miroslav Ploščica.
In: Mathematica Slovaca. -- ISSN 0139-9918. -- Roč. 59, č. 2 (2009), s. 221-230.
[PLOŠČICA, Miroslav (100%)]
- ADF4 On relative uniform completion of an archimedean lattice ordered group / Štefan Černák, Judita Lihová.
In: Mathematica Slovaca. -- ISSN 0139-9918. -- Roč. 59, č. 2 (2009), s. 231-250.
[ČERNÁK, Štefan (50%) - LIHOVÁ, Judita (50%)]

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Charles University, Institute of Physics, Prague, Czech Republic

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European Organization for Nuclear Research (CERN), Geneva, Switzerland

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Massachusetts Institute of Technology, Department of Physics, Boston, USA

National Centre for Scientific Research, Very Low Temperature Research Centre, Grenoble, France

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University of Cairo, Egypt

Pierre and Marie Curie University, Laboratory of Physics and Chemistry of Biomolecules, Paris, France

University of Bayreuth, Institute of Physics, Germany

University of Athens, Greece

University of Rajasthan, Department of Physics, Jaipur, India

University of Jammu, Department of Physics, Jammu, India

University of Lodź, Department of Solid State Physics, Lodz, Poland

University of Naples “Federico II”, Department of Physics, Naples, Italy

University of Bologna, Department of Biochemistry, Italy

University of Lund, Department of Physics, Lund, Sweden

University of Stockholm, Department of Physical Chemistry, Arrhenius Laboratory, Sweden

University of Florida, Department of Physics, Gainesville, USA

Ukrainian Academy of Sciences, Institute for Low Temperature Physics, Kharkov, Ukraine

Uzhgorod State University, Department of Physics, Uzhgorod, Ukraine

V. G. Khlopin Radium Institute, St. Petersburg, Russia

Vienna University of Technology, Institute of Experimental Physics, Vienna, Austria

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European Structural Fund Projects

Centre of advanced physical studies of materials in extreme conditions

ITMS 26220120005, 2009 – 2011

Scientific guarantor: Alexander Feher

Members: Marcela Kajňaková, Vladimír Komanický, Adriana Zeleňáková, Tomáš Samuely, Alžbeta Orendáčová, Erik Čížmár, Martin Orendáč, Anna Zorkovská, Michal Jaščur, Andrej Bobák, Jozef Strečka, Martin Gmitra (Institute of Physics), Vladimír Zeleňák, Martin Vavra, Juraj Černák, Ivan Potočňák, Juraj Kuchár (Institute of Chemistry)

Partners: Institute of Experimental Physics Slovak Academy of Sciences

Centre of Excellence of Progressive Materials with Nano and Submicroneous Structure

ITMS 26220120019, 2009 – 2011

Scientific guarantor: Pavol Sovák,

Members: Peter Kollár, Ján Füzser, Vladimír Girman, Rastislav Varga, Adriána Zeleňáková (Institute of Physics); Vladimír Zeleňák (Institute of Chemistry)

Partners: Institute of Materials Research Slovak Academy of Sciences
Institute of Experimental Physics Slovak Academy of Sciences
Institute of Geotechnics Slovak Academy of Sciences

Centre for Cosmic Research: Influence of the Cosmic Weather

ITMS 26220120009, 2009 – 2011

Scientific guarantor: Štefan Parimucha

Members: Rudolf Gális, Alexander Dirner, Marián Kireš (Institute of Physics)

Partners: Astronomical Institute Slovak Academy of Sciences
Institute of Experimental Physics Slovak Academy of Sciences

Selected Research Projects

Physical properties of Complex system and Nanoobjects - computere simulations

APVV-RP EU - 0006-07

(Jozef Černák, 09/2008 – 12/2009)

Magnetothermal properties of novel low-dimensional magnetic materials

APVV-0006-07

(Alexander Feher, 09/2008 – 12/2010)

Targeted photodynamic therapy of cancer: from delivery system through cellular signaling to in vivo model

APVV-0449-07

(Pavol Miškovský, 09/2008 – 12/2010)

Development of videoconference archives system AVE and users applications for EVO system

APVV-0732-07

(Pavel Murín 02/2008 – 12/2010)

Centre of cryophysics and cryonanoelectronics

VVCE-0058-07

(Alexander Feher, 07/2008 – 12/2011)

Actual and modern environmental experiments in physics education on basic and secondary schools.

KEGA 3/5272/07

(Ján Degro, 01/2007 – 12/2009)

Interactive computer-based activities as a means of the development of key and subject competencies of high school students and their implementation into physics teaching

KEGA 3/6300/08

(Zuzana Ješková, 01/2008 – 12/2010)

New forms and phase transitions of nuclear matter at extremal energy densities.

Contribution to the development and realization of electronics of pixel silicon detector (SPD) and trigger system for experiment ALICE.

CERN-ALICE-KE UPJŠ

(Jozef Urbán, 01/1996 – 12/2010)

Computer simulations of tumor growth by cellular automata and agent-based models.

VEGA 1/4021/07

(Branislav Brutovský, 01/2007 – 12/2009)

Study of structural and magnetic properties of amorphous and nanocrystalline ferromagnetic materials.

VEGA 1/4009/07

(Pavol Sovák, 01/2007 – 12/2009)

Interactions of light nuclei and spin effects.

VEGA 1/4010/07

(Gabriela Martinská, 01/2007 – 12/2009)

Detection of trace amounts of molecules by chemical sensors based on roughed metal surfaces.

VEGA 1/4449/07

(Gabriela Fabriciová, 01/2007 – 12/2009)

Research of structural and magnetic properties of amorphous, nanophased and nanocomposite systems based on 3d transition elements Fe, Co, Ni.

VEGA 1/4020/07

(Peter Kollár, 01.2007 - 12.2009)

Study of mechanisms of cell signal transduction.

VEGA 1/4019/07

(Jozef Uličný, 01.2007 – 12.2009)

Construction of a UV resonance Raman apparatus and its application for drug-biomacromolecule interaction studies.

VEGA 1/0124/08

(Gregor Bánó, 01/2008 – 12/2010)

Many particle Green function method of layered systems with magnetic anisotropies and absorption of spin waves

VEGA 1/0138/08

(Vladimír Ilkovič, 01/2008 – 12/2010)

A theoretical study of the quantum and classical spin systems

VEGA 1/0128/08

(Andrej Bobák, 01/2008 – 12/2010)

Study of emission of charged particles and nuclear fragments in interactions of relativistic stable and radioactive atomic nuclei in photoemulsion (experiment BECQUEREL in JINR at Dubna)

VEGA 1/0080/08

(Stanislav Vokál, 01/2008 – 12/2010)

Influence of magnetic field on the quantum processes in geometrically frustrated magnets

VEGA 1/0078/09

(Alžbeta Orendáčová, 01/2009 – 12/2011)

Strongly correlated electrons and magnetism in selected transition metal oxides and TCNQ-salts

VEGA 1/0159/09

(Alexander Feher, 01/2009 – 12/2011)

Photochemical, photophysical and biophysical characterization of low-density lipoprotein based delivery systems loaded with photosensitizers hypericin and Foscan®

VEGA 1/0164/09

(Daniel Jancura, 01/2009 – 12/2011)

Magnetic properties of magnetic microwires as materials perspective for spintronics and technical applications.

VEGA 1/0076/09

(Rastislav Varga, 01/2009 – 12/2011)

Selected Results

VEGA 1/4009/07 (Sovák): In the project was studied the influence of selected substitutions of Fe atoms in Finemet-type alloys (Fe-M-Cu-Nb-Si-B, kde M= V, Mn, Ce, , Ge, Co) to form their nanocrystalline structure by both annealing treatment and chemical composition. Both structural and magnetic measurements of Mn-doped alloys confirmed that small Mn content (less than 3%) enhances magnetic exchange interaction, the effect of magnetic softening has been observed. Nanocrystalline state is represented by Fe₃Si phase with Do₃ structure. The influence of Mn on crystallization temperature of nanophase T_{x1} (increasing) and crystallization temperature of borides T_{x2}(decreasing) was confirmed (Kolát S., Bayri N., Michalík Š., Izgi T., Sovák P., Atalay F.E., Gencer H., Atalay S., Journal of Non-Crystalline Solids, 355 (2009) 2562-2566).

VEGA 1/0078/09 (Orendáčová): Specific heat and ac magnetic susceptibility measurements, spanning low temperatures (T>40 mK) and high-magnetic fields (B<14 T), have been performed on a two-dimensional antiferromagnet Cu(tn)Cl₂ (tn=1,3-diaminopropane=C₃H₁₀N₂). In fields lower than

the saturation field, $B_{\text{sat}}=6.6$ T, a specific heat anomaly, appearing near 0.8 K, is ascribed to bound vortex-antivortex pairs stabilized by the applied magnetic field. The resulting magnetic phase diagram is remarkably consistent with the one predicted for a square lattice without a frustrating interaction, expect that B_{sat} is shifted to values lower than expected. Potential explanations for this observation, as well as the possibility of a Berezinski-Kosterlitz-Thouless phase transition in a spatially anisotropic triangular magnet with the collinear Néel ground state, are discussed (Orendáčová A., Čížmár E., Sedláková L., Hanko J., Kajňaková M., Orendáč M., Feher A., Xia J. S., Yin L., Pajerowski D. M., Meisel M. W., Zeleňák V., Zvyagin S., Wosnitza J. Phys. Rev. B 80 (2009) 144418).

MANUNET (Varga): The new class of magnetic nanocrystalline materials has been developed that is characterized by high magnetization and Curie temperature. The magnetostriction of the new class of materials remains constant even in nanocrystalline state. Hence, nanocrystalline microwires obeys magnetic bistability within the wide range of annealing temperatures (Klein P., Varga R., Vojtanik P., Kovac J., Ziman J., Badini-Confalonieri G. A., Vazquez M., J. Phys. D: Appl. Phys. 43 (2009) 045002).

VEGA 1/0128/08 (Bobák): Compensation behaviour and magnetic susceptibility of a mixed ferro-ferrimagnetic ternary alloy of the type AB_pA_{1-p} on a cubic lattice have been studied by the use of a Monte Carlo simulations. We have found that the magnetic susceptibility does not diverge at a critical temperature identical with a compensation temperature of the ferromagnetic system. The relation of the studied model to ternary Prussian blue analogs, where this behaviour has been observed experimentally, is also discussed (Dely J., Bobák A., Žukovič M., Phys. Lett. A 373 (2009) 3197-3200).

APVVV-0449-07 (Miškovský): Study of time resolved fluorescence and phosphorescence of the Hyp/LDL complex as well as kinetics of generation and annihilation of singlet oxygen after photodynamic action in the complex has been studied. Decreasing of the Hyp fluorescence lifetime for the complex ratio of Hyp/LDL >25:1, was observed, which indicates selfquenching of Hyp fluorescence. We also provide clear evidence that for the determination of the real intracellular concentration of hydrophobic photosensitizers, like Hypericin, it is not sufficient to measure the fluorescence intensity of the molecule. The combination of the steady state and time resolved fluorescence spectroscopies is the only way to reach correct estimation of the intracellular concentration of such fluorescence drugs (Bálint Š. et al., J. Phys. Chem. 113 (2009) 17724-17729; Breitenbach T. et al., Photochem. Photobiol. Sci. 8 (2009) 442-445).

VEGA 1/4021/07 (Brutovský): Computer simulations of tumor growth by cellular automata and agent-based models. The project has ambition to study tumor growth from the point of view of statistical physics, focusing on the processes of selforganization, phase transitions, fractal behavior, scaling laws, etc. For our purposes we have developed model which combines cellular automata and evolutionary optimization and enables us to simulate close-to-circular growth by desired rate as well as fractal dimension of tumor-host interface. We have found correlations of some growth characteristics of the model with experimentally observed features (Kočíšová J., Horvath D., Brutovský B, Physica A 388 (2009) 3585-3592).

VEGA 1/0159/09 (Feher): An anion-radical salt (ARS)(N-Me-2,5-di-Me-Pz)(TCNQ)₂, where Pz is pyrazine, was synthesized and its crystal structure was resolved. X-ray diffraction experiments on single crystals were performed. Heat capacity was measured in the temperature range from 2 to 300 K. Magnetisation and magnetic susceptibility were measured in the temperature range from 2 to 300 K and the low-temperature part was measured in magnetic fields from 5 mT to 5 T. The experimental results were explained in terms of dimerized Heisenberg spin 1/2 chain model. Numerical calculations were performed and compared with experimental data. (A. Radváková, D.V. Ziolkovskiy, V.O. Cheranovskii, A. Feher, M. Kajňaková, O.N. Kazheva, G.G. Alexandrov, O.A. Dyachenko, V.A. Starodub, Journal of Physics and Chemistry of Solids 70 (2009) 1471-1477).

APVV-VVCE 0058-07 (Feher): The polymeric complex, $\{[\text{Cu}(\text{tmen})][\text{Pt}(\text{CN})_4]\}_n$ (tmen = tetramethylethylenediamine) has been synthesized and characterized by elemental analysis, infrared spectroscopy, single-crystal structure analysis and by measurement of magnetic properties. Four $\nu(\text{C}\equiv\text{N})$ absorption bands have been recorded in the infrared spectrum of this compound, what corresponds with four different types of cyano groups in the structure. Crystal structure revealed that one cyano group is terminal whereas three crystallographically different cyano groups of $[\text{Pt}(\text{CN})_4]^{2-}$ anions bridge Pt(II) and Cu(II) atoms to form a two-dimensional structure with a weak antiferromagnetic exchange coupling. (M. Vavra, I. Potočník, M. Kajňaková, E. Čižmár, A. Feher, *Inorganic Chemistry Communications* 12 (2009) 396-398).

VEGA 1/4020/07 (Kollár): The magnetic properties of the permalloys Ni₈₁Fe₁₉ and supermalloys Ni₇₉Fe₁₆Mo₅ show strong dependence to its initial, master powder, using cryomilling and annealing conditions. The bulk sample Ni₇₉Fe₁₆Mo₅ is found to show better soft magnetic properties over the Ni₈₁Fe₁₉ bulk sample, which is connected with the presence of Mo element, that slows down the ordering kinetics and lowers the degree of long range order thereby increase the resistivity and hence improves the magnetic eddy current losses. . The contribution to coercivity, HC due to volume pinning results from the presence of internal stress and pores. Very good soft magnetic properties can be tailored to the need of certain requirements by adjusting the chemical composition, the processing routes such as compaction, and heat treatment conditions. We have prepared bulk samples in the form of the small cylinders with coercivity down to 11 A/m with flexibility in shape and dimensions using compaction method. (J. Fúzer, P. Kollár, D. Olekšáková, S. Roth, *J. Alloys Compd.*, 483 (2009) 557-559).

VEGA 1/0076/09 (Varga): The domain wall dynamics in thin magnetic wires has been studied focusin on the effect of structural relaxation. It has been shown that the domain wall damping can vary wiothin one order by properly setting the frequency of applied magnetic field (G. Infante, R. Varga, G. A. Badini-Confaloneri, and M. Vázquez, „Locally induced domain wall damping in a thin magnetic wire“, *APPLIED PHYSICS LETTERS* 95 (2009) 012503).

ALICE experiment, CERN (Urbán): ALICE experiment among all experiments on LHC was the first one publishing physics results from proton-proton collisions. The importance of this publication is the demonstration of system functioning of such a sophisticated and complex system as ALICE detector and LHC collider are and as well to demonstrate a readiness for the anticipated important discoveries in elementary particle physics. (*Eur. Phys. J. C:* 65 1 (2010) 111).

VEGA 1/4010/07 (Martinská): The extracted s-wave scattering amplitude from both the polarised and unpolarized $d + d \rightarrow {}^4\text{He} + \eta$ reaction at 2385,5 MeV/c allowed to determine the scattering lenght which fulfills the requirements for bound eta. In the $p + {}^{27}\text{Al} \rightarrow {}^3\text{He} + \pi^- + p + X$ reaction studied at recoil free kinematics the eta meson is produced almost at rest and so it can be bound with enhanced probability. This state proceeds via N (1535) resonances and the decay products proton and pion emitted into opposite direction are detected in coincidence with ${}^3\text{He}$ produced at zero degree. Under these condition some hints for bound state can be observed with an upper limit of the cross section of $\sim 0,5$ nb . Data was taken at COSY. (Budzanowski A.,... Martinská G., Urbán J. et al., *Phys. Rev. C*79, 012201(R) (2009) 1-4, *Nuclear Physics A* 821(2009) 193- 209, *International Journal of Modern Physics A* 24 (2009) 206-213).

VEGA 1/0080/08 (Vokál): The fragmentation of light relativistic nuclei in the energy range of few GeV/nucleon in the frame of BECQUEREL experiment in LHEP JINR at Dubna has been studied. The new experimental results on fragmentation of ${}^8\text{B}$ and ${}^{11}\text{B}$ nuclei in nuclear track emulsions have shown that the contribution of th dissociation channel ${}^8\text{B} \rightarrow {}^7\text{Be} + p$ is dominant in events that do not involve the production of target-nucleus fragments or mesons . In three-body breakup of ${}^{11}\text{B}$ the leading channel is 2+2+1 charge configuration where tritons are revealed to play a crucial role among the single charged projectile fragments. (R. Stanoeva, ..., S.Vokál, ... (BECQUEREL Collaboration), *Physics of Atomic Nuclei* 72 (2009) 690-701, M.Karabová, ..., S.Vokál, ..., J.Vrláková, ... (BECQUEREL Collaboration), *Physics of Atomic Nuclei* 72 (2009) 300-304).

VEGA 1/4449/07 (Fabriciová): This project was terminated in December 2009 and we have obtained several interesting results in the field of an application SERS technique. A combined application of SERS and SEF enabled a construction of simple model of Hyp/LDL complex at different concentration ratios Hyp/LDL. By combination of SERS and optical tweezers we have detected vibrational spectra of emodin. This result is a very promising step towards utilization of SERS technique in monitoring of intracellular localization and distribution of low-molecular chemical compounds (e.g. drugs). By means of SESR concentration limits for the detection of several hydroxyquinones molecules (emodin, danthron, alizarine, quinizarin) in aqueous solutions were determined (G. Lajos et al., J. Phys. Chem. C, 2009, 113, 7147-7154).

Selected Publications

ADC - Scientific works in the foreign Current Contents periodicals (74)

- ADC1 (N-Me-2,6-di-Me-Pz)(TCNQ)(2)-genuine organic anion-radical salt: a spin-ladder? / A. Radvákóvá ... [et al.]..
In: Journal of Physics-Condensed Matter. -- ISSN 0953-8984. -- vol. 21, iss. 17(2009), p. 175405-175411.
[RADVÁKOVÁ, Alena - ZIOLKOVSKIY, D. V. - KAJŇÁKOVÁ, Marcela - LASKOWSKA, B. - BARSZCZ, B. - GRAJA, A. - STARODUB, V. A. - FEHER, Alexander]
- ADC2 AC magnetic properties of the bulk Fe-Ni and Fe-Ni-Mo soft magnetic alloys prepared by warm compaction / Ján Füzér... [et al.].. -- Abstrakt bol publikovaný v zborníku ISMANAM 2007 : 14th International Symposium on Metastable and Nano-Materials : scientific program and book of abstracts : Corfu, Greece, 26th-30th August, 2007, s. 209.
In: Journal of Alloys and Compounds. -- ISSN 0925-8388. -- vol. 483 (2009), p. 557-559.
[FÜZER, Ján - KOLLÁR, Peter - OLEKŠÁKOVÁ, Denisa - ROTH, Stefan]
- ADC3 A novel two-dimensional Ni(II) fumarate complex: Solvothermal synthesis, crystal structure and magnetic properties / Juraj Černák ... [et al.]..
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- ADC62 Shape-dependent activity of platinum array catalyst / Vladimir Komanicky ... [et al.]..
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- ADC65 Spin-peierls transition in dimerized stacks of anion-radical salt (N-Me-2,5-di-Me-Pz)(TCNQ)(2), (Pz is pyrazine) / A. Radvákóvá ... [et al.]..
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- ADC67 Structural properties and Mössbauer spectroscopy of Finement doped with Ge / Adam Puszkarcz ... [et al.]..
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- ADC68 Structure and magnetic properties of Fe(Mn)-Si-B-Nb-Cu alloys / S. Michalík ... [et al.]..
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[MICHALÍK, Štefan (50%) - SOVÁK, Pavol (10%) - BEDNARČÍK, Jozef (10%) - KOLLÁR, Peter (10%) - GIRMAN, Vladimír (20%)]
- ADC69 Systematic measurements of identified particle spectra in pp, d+Au, and Au+Au collisions at the STAR detector / B.I. Abelev ... [et al.].. -- STAR Collaboration.
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- ADC72 The method of normalized correlations: a fast parameter estimation method for random processes and isotropic random fields that focuses on short-range dependence / Milan Žukovič, Dionissios T. Hristopulos..
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- ADE1 Anisotropy of static and dynamic order-disorder transition in YBa₂Cu₃O_{7-d} / Dmytro Lotnyk ... [et al.].. -- Abstrakt bol publikovaný v zborníku LT25 Low Temperature Physics :

- 25th international conference : August 6-13, 2008 : RAI Convention Centre Amsterdam, Netherlands, s. 95.
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- ADE2 Astrobaster - a fascinating game of multi-ball collisions / Marián Kireš.
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- ADE3 Čiastkové výsledky výskumu úrovne psychodidaktických kompetencií učiteľov / Ján Bajtoš ... [et al.].. -- Článok bol publikovaný aj v zborníku Modernizace vysokoškolské výuky technických predmětů : sborník příspěvku z mezinárodní vědecké konference, konané 1. dubna 2009. Hradec Králové : Gaudeamus, 2009. ISBN 978-80-7041-611-2, s. 16-21..
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- ADE4 Exchange interaction in complexes Bis[(1,3-Dithiole-2-Thione-4,5-Dithiolato)-di(Carbonyl)-Cyclopentadienyl Iron(II)] / S.V. Vitushkina ... [et al.]..
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- ADE9 Minima times of selected eclipsing binaries / Parimucha, Š. ... [et al.]..
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- ADE10 Multiple frustration-induced plateaus in a magnetization process of the mixed spin-1/2 and spin-3/2 Ising-Heisenberg diamond chain / J. Sterčka et al..
In: Journal of Physics Conference Series. -- ISSN 1742-6596. -- vol. 145 (2009), p. 012058-1 - 012058-4.
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- ADE11 Phase transformations in Nd₂/3Ca₁/3MnO₃: Effect of Y substitution / Elena Fertman ... [et al.]..
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[FERTMAN, Elena - BEZNOSOV, A. B. - DESNENKO, V. - KAJŇAKOVÁ, Marcela - FEHER, Alexander]
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[ONDEROVÁ, Ľudmila]
- ADE13 Programma poljarizacionnykh issledovaniy i vozmožnosti uskorenia poľarizovannykh pučkov protonov i ľogkich jader na nuklotrone OIJaI. / S. Vokal ... [et al.]..
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[VOKÁL, Stanislav (15%) - KOVALENKO, A.D. (5%) - KONDRATENKO, A.M. (5%) - KONDRATENKO, M.A. (5%) - MICHAĬLOV, V.A. (5%) - FILATOV, Ju.N. (5%) - SHIMANSKY, S. S. (60%)]
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- ADE15 Spontaneous order in the highly frustrated spin-1/2 Ising-Heisenberg model on the triangulated Kagomé lattice due to the Dzyaloshinskii-Moriya anisotropy / J. Strečka, L. Čanová..
In: Journal of Physics Conference Series. -- ISSN 1742-6596. -- vol. 145 (2009), p. 012012-1 - 012012-4.
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[SUŇOL, J.J. (14,32%) - SAURINA, J. (14,28%) - VARGA, Rastislav (14,28%) - HERNANDO, Blanca (14,28%) - SÁNCHEZ LLAMAZAREZ, J. L. (14,28%) - SANTOS, J.D. (14,28%) - PRIDA, V. (14,28%)]

ADF - Scientific works in the domestic non Current Contents periodicals (3)

- ADF1 Bezšnúrový telefón v kabinete / Ján Degro, Miriam Feretova, Monika Leššová..
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In: Tvorivý učiteľ fyziky : zborník príspevkov : 19.-22.apríl 2009, Smolenice. -- Bratislava :
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