

DEPARTMENT OF PHYSICS
<http://kf-lin.elf.stuba.sk/kf.html>

Head of Department

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I. STAFF

Professors	Prof. Ing. Drahoslav Barančok, DrSc.†, Prof. Ing. Rudolf Durný, DrSc., Prof. RNDr. Július Krempaský, DrSc., Prof. Ing. Ivan Štich, DrSc.
Associate Professors	Doc. Ing. Peter Ballo, PhD., Doc. Ing. Otto Budke, PhD., Doc. Ing. Július Cirák, PhD., Doc. RNDr. Ivan Červeň, PhD., Doc. Ing. Peter Dieška, PhD., Doc. RNDr. Edmund Dobročka, PhD., Doc. Ing. Ján Vajda, PhD., Doc. RNDr. Pavol Valko, PhD.
Assistant Professors	Ing. Peter Bokes, PhD., Ing. Ondrej Foltin, PhD., Ing. Vladimír Scholtz, Ing. Pavol Tomčík, RNDr. Milan Valach, RNDr. Mária Valková, Mgr. Marek Vančo, Ing. Alfréd Vlnieška, Ing. Ivan Zelenay, PhD.
Senior Scientist	Ing. Jozef Bielek, PhD.
Research Workers	Ing. Zdenko Hrček, Ing. Ľuboš Keleši, Mgr. Martin Konôpka, PhD., RNDr. Martin Moško, PhD., Ing. Jaroslav Tóvik, PhD.
Technical Staff	Zuzana Váciová (secretary), Štefan Kučera
PhD. Students	Ing. Karolína Kočišková, Ing. Jana Röschlová, RNDr. Róbert Turanský, Ing. Martin Weis

II. EQUIPMENT

II.1 Teaching and Research Laboratories

- Laboratories of elementary and advanced physics
- Laboratory of ordered molecular layers and systems
- Laboratory of applied optics
- Laboratory of electrical transport
- Laboratory of X-ray diffraction
- Laboratory of thermophysical properties
- Laboratory of macrostructure of composites
- Laboratory of material simulation
- Laboratory of spectroscopy
- Center for computational materials science

II.2 Special Measuring Instruments and Computers

- Refrigerator cooled cryostat NOK-10-3D
- Langmuir - Blodgett deposition device, Nima, U.K.
- Electrostatic voltmeter Trek
- 7801 Solartron special multimeter
- Measuring microscope CZJ
- X-ray diffraction powder goniometer
- 4 numerical servers (clusters) and supporting infrastructure
- Sun storage tek 6140 FC maxperf
- Parallel computer with 14 CPU + 28 GB RAM.

III. TEACHING**III.1 Undergraduate Study (Bc.)**

Subject, semester, hours per week for lectures and for seminars or practical exercises, name of lecturer

Introduction to Technical Physics	(1st sem., 0-2h)	K. Kočišková, V. Scholtz, M. Vančo
Physics	(2nd sem. 3-2h)	J. Círák
Physics I	(2nd sem. 3-2h)	P. Ballo, O. Foltin, P. Valko
Special Seminar - Physics I	(2nd sem., 0-2h)	P. Ballo, O. Foltin, P. Valko
Physics II	(2nd sem., 3-3h)	P. Valko
Physics I	(3rd sem., 3-2h)	P. Dieška
Special Seminar - Physics I	(3rd sem., 0-2h)	P. Dieška
Physics II	(3rd sem., 3-2h)	P. Ballo, O. Foltin, P. Valko
Special Seminar - Physics II	(3rd sem., 0-2h)	P. Ballo, O. Foltin, P. Valko
Modern Physics	(5th sem., 3-2h)	P. Bokes
Thermodynamics of Materials and Statistical Physics	(5th sem., 3-2h)	M. Moško
Quantum and Statistical Physics	(6th sem., 3-2h)	I. Štich
Solid State Physics	(7th sem., 3-2h)	R. Durný
Computer Simulations	(7th sem., 2-3h)	P. Ballo
Conductors and Superconductors	(7th sem., 2-2h)	R. Durný
Modern Methods of Material Diagnostics	(8th sem., 3-2h)	D. Barančok
Semiconductors	(8th sem., 2-2h)	P. Dieška

III.2 Graduate Study (Ing.)

Physics of Processes	(1st sem., 3-2h)	P. Bokes
Superconductivity and Low Temperature Physics	(1st sem., 2-2h)	R. Durný
Nanotechnologies	(1st sem., 2-2h)	J. Círák
Bioelectronics	(1st sem., 2-1h)	J. Círák
Principles of Applied Optics	(1st sem., 2-2h)	J. Vajda
Non-equilibrium Systems and Chaos	(1st sem., 3-2h)	J. Krempaský
Computer Physics	(2nd sem., 2-2h)	I. Štich
Physics of Materials	(2nd sem., 3-2h)	D. Barančok, V. Ďurman
Applied Optics	(2nd sem., 3-2h)	J. Vajda
Biomaterials and Biosystems	(2nd sem., 2-2h)	J. Círák

III.3 Undergraduate and Graduate Study for Foreign Students (in English Language)

Seminar - Physics I

(1st sem., 1-0h) O. Foltin

IV. RESEARCH PROJECTS

- Cluster of advanced studies ESF. J. Cirák
- Physical properties of organic two-dimensional systems and formation of nanostructures for molecular electronics. VEGA 1/3038/06. J. Cirák
- Manufacture and properties of particulate composite systems based on carbon and modified by outstandingly conductive particles, diverse in size. G 1/7269/20. Š. Emmer, J. Bielek
- Sound, image and biomedical signals digital processing. 102/VTP/2000, P. Fuchs, J. Bielek
- Gradient materials prepared by powder metallurgy of micro- and nano-particles. APVV-20-057805. Š. Emmer, J. Kováčik, J. Bielek
- Investigation of magnetic materials for electrical engineering, electronics, recording and electromagnetic compatibility applications. VEGA 1/3096/06. J. Sláma, J. Bielek
- Physical interrelation in the sun-magnetosphere system and sunshine. VEGA 2/2009. A. Prigancová, J. Bielek
- Analysis of kinetics of reactions connected with charge transfer in solid and liquid systems. 2/1013/22. R. Durný
- New techniques of scanning probe microscopy and nanostructure analysis spectroscopy. APVT-51-013904. R. Durný
- Center of excellency of SAS – Center of electronic and electrotechnical components of new generation. SENG. R. Durný
- Stress controlled molecular electronics (Stressmol). Supported by Volkswagen Stiftung + Nem/Slov/FEI STU 2/03. I.Štich
- Analysis and manipulation of materials at atomic scale, using AFM. APVT-20-21505, I. Štich
- Engineering properties of nanoparticles using pressure and stress: Nanostress. C/S-b-Sti-Sk1-Nanostress. I. Štich.
- Interactive multimedial project of teaching physics in technical universities. KEGA 3/108003. P. Ballo, J. Krempaský, I. Červeň
- Ab-initio approach to conductance of quantum junctions accounting for dynamical correlation of electrons. NATO EAP.RIG 981521. P. Bokes
- Calculation of conductance of quantum junctions at ab-initio level. VEGA 1/2020/05. P. Bokes
- Study and modelling of thermophysical properties of composites. VEGA 2/5100/25. V. Boháč, P. Dieška
- Study of fast phase transitions, resulting in a topology defects creation. VEGA 1/2019/05. P. Valko
- Materials for fusion technologies, Euratom FU06-CT-2006-00441. P. Ballo

V. COOPERATION

V.1 Cooperation in Slovakia

- Faculty of Chemical and Food Technology, STU, Bratislava
- Faculty of Informatics and Information Technologies, STU, Bratislava
- Faculty of Mechanical Engineering, STU, Bratislava
- Faculty of Material Technology, STU, Trnava
- University of Trnava, Trnava
- Natural Science Faculty, Comenius University, Bratislava
- Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava
- Faculty of Pharmacy, Comenius University, Bratislava

- Faculty of Industrial Technologies, University of Trenčín, Púchov
- Electrotechnical Faculty, University of Žilina, Žilina
- Institute of Physics, Slovak Academy of Sciences, Bratislava
- Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava
- Institute of Anorganic Chemistry, Slovak Academy of Sciences, Bratislava
- Institute of Polymers, Slovak Academy of Sciences, Bratislava
- Geophysical Institute, Slovak Academy of Sciences, Bratislava
- Institute of Materials and Machine Mechanics, Bratislava
- IBOK, Bratislava

V.2 International Cooperation

- Tomáš Baťa University, Zlín, CzR
- Institute of Macromolecular Chemistry, AVČR, Prague, CzR
- Institute of Physics, AVČR, Prague, CzR
- Faculty of Electrical Engineering, Czech Technical University, Prague
- Inst. of Immunology and Microbiology, 1st Medical Faculty, Charles University, Prague
- Institute of Materials Science - Demokritos, Athens, Greece
- Tokyo Institute of Technology, Tokyo, Japan
- Fukuoka University, Fukuoka, Japan
- Fudan University, Shanghai, China
- University of York, U.K.
- Universidad Autonoma de Madrid, Spain
- Centro de Fisica Nuclear, Lisbon, Portugal
- International School for Advanced Studies (SISSA), Trieste, Italy
- Ruhr Universität, Bochum, Germany
- Physikalisches Institut, Universität Münster, Germany
- Delft University, Delft, The Netherlands
- Brussels Free University, Institute of Physics, Brussels, Belgium
- Institute of Solid State Physics, Graz University of Technology, Graz, Austria

V.3 Membership in International Organizations and Societies

- P. Bokes, J. Cirák, I. Štich: American Physical Society
- P. Ballo, D. Barančok †, P. Bokes, J. Cirák, I. Červeň, R. Durný, J. Krempaský : Europhysical Society
- J. Cirák: IEEE
- P. Bokes: Institute of Physics
- J. Krempaský: European Society for Science and Arts

VI. THESES

VI.1 Master Theses

Master thesis supervised at the Department of Physics. The name of supervisor is in brackets.

- [1] D. Chovanová: Study of electronic structure in nanoconductors and nanocontacts. (P. Bokes)
- [2] P. Križan: Analysis of selected properties of volt-coulometric method for electrochemistry. (M. Weis)
- [3] S. Nagy: Calculation of structure in metals, using *EAM* potentials and stochastic methods. (P. Ballo)
- [4] M. Diešková: *Ab-initio* study of ultra thin boundaries at *Al/AIO_x/Al*. (P. Bokes)
- [5] K. Jarolímek: Study of point defects in *Si* by quantum-mechanical methods. (P. Ballo)
- [6] R. Korytár: Study of response of inhomogeneous gas on external electric field. (P. Bokes)

VII. OTHER ACTIVITIES

- Organizing the 12th international workshop - Applied Physics of Condensed Matter, APCOM '06. Malá Lučivná, 21.-23.6.2006, J. Vajda, M. Weis
- Task group for physics - Accreditation commission, I. Štich
- Academic ranking and rating agency, I. Štich
- Club of physicists, D. Barančok †, M. Weis
- Aldebaran group for astrophysics, V. Scholtz
- Board of editors, J. Electrical Engineering, P. Ballo

VIII. PUBLICATIONS**VIII.1 Journals****VIII.2 Conferences****VIII.3 Textbooks****VIII.4 Patent**