

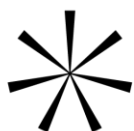


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Faculty of Mathematics, Physics and Computer Science

informational presentation
for 2023/2024



ATHENA

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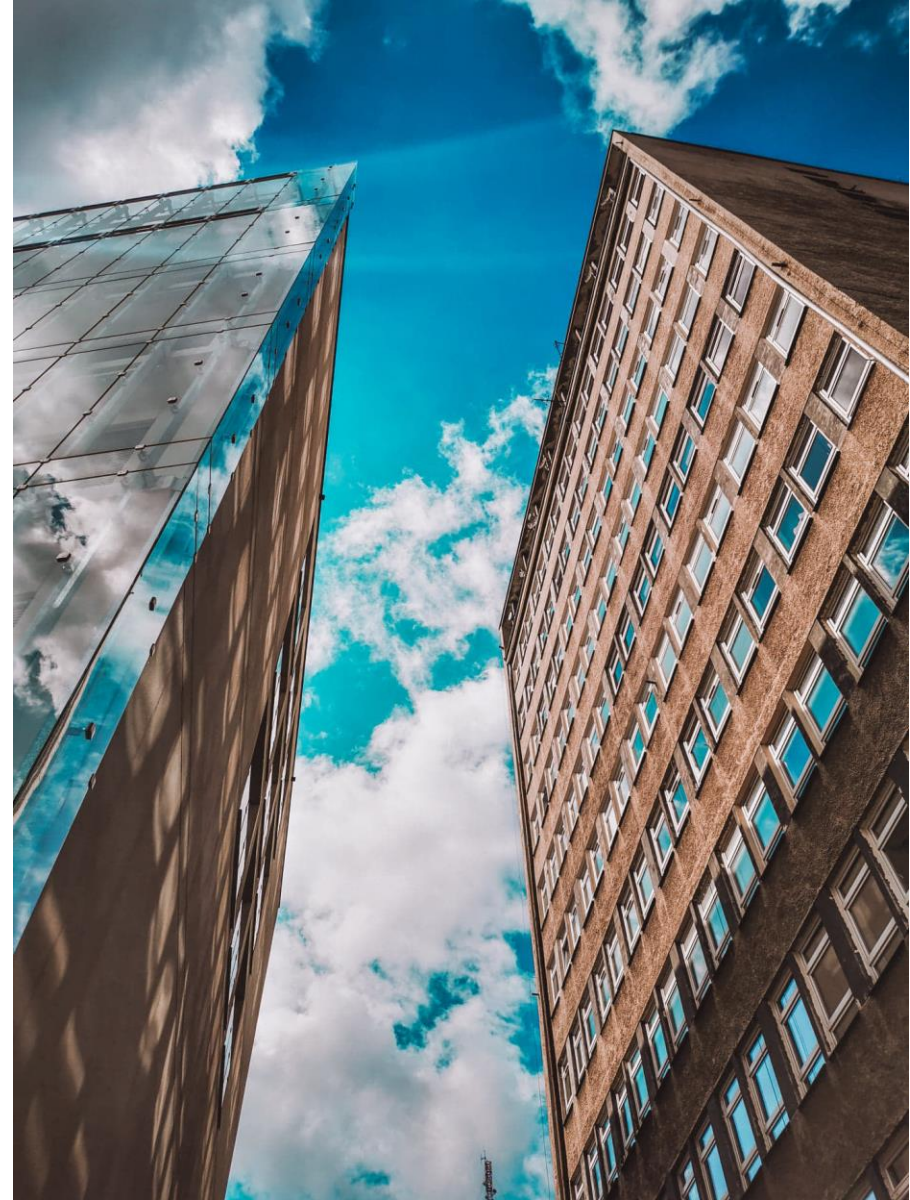
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Faculty structure

There are three Institutes within the Faculty of Mathematics, Physics and Computer Science:

- Institute of Mathematics
- Institute of Physics
- Institute of Computer Science



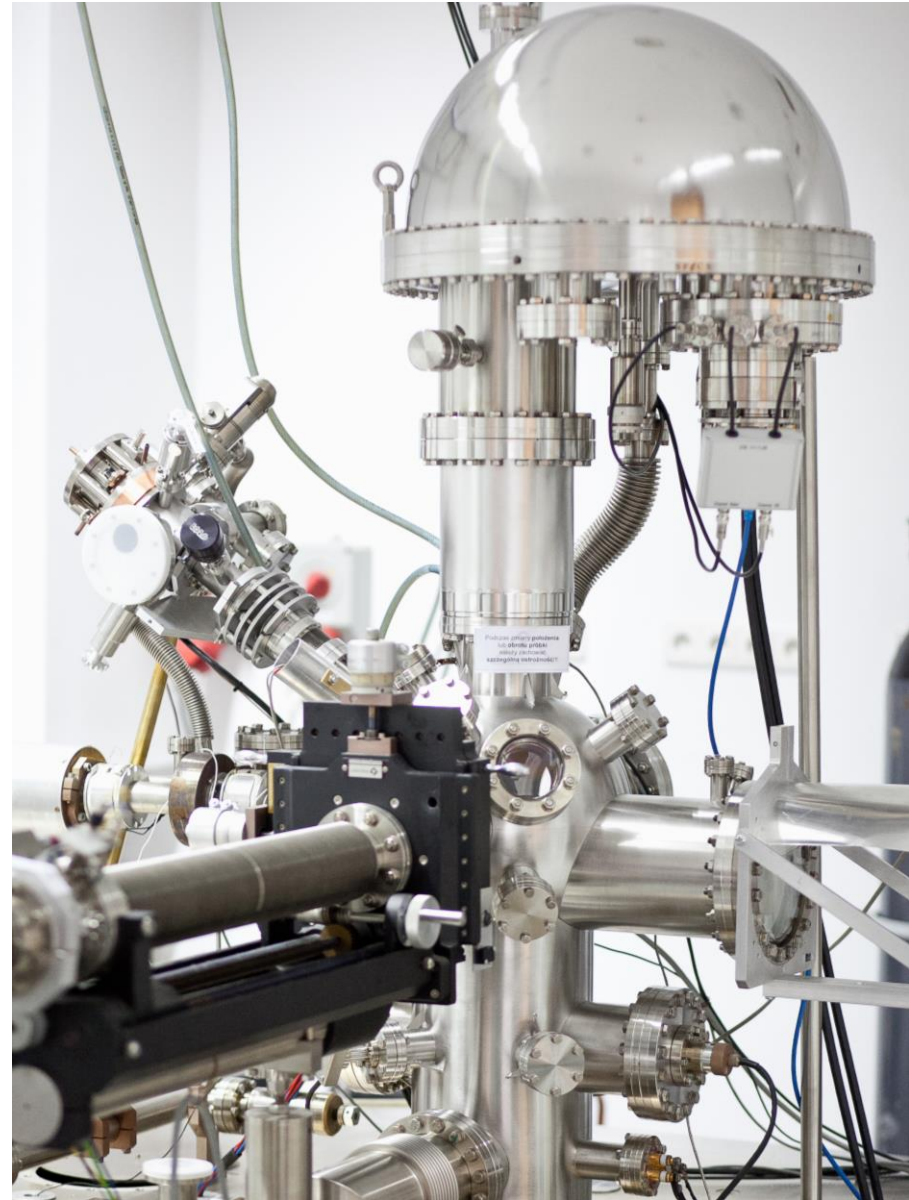
Institute of Mathematics

- Department of Mathematical Analysis
- Department of Applied Mathematics
- Department of Mathematics and Computer Science Teaching



Institute of Physics

- Department of Biophysics
- Department of Materials Science
- Department of Surface and Nanostructure Physics
- Department of Theoretical Physics



Institute of Computer Science

- Department of Cybersecurity and Computational Linguistics
- Department of Fundamentals of Computer Science
- Department of Information Systems Software
- Department of Neuroinformatics and Biomedical Engineering



The Faculty employs:

- **23** of teaching staff
- **90** research and teaching employees
- **17** scientific and technical employees
- **16** administrative employees
- **7** IT employees





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Scientific research conducted at the Institute of Mathematics

1. *Interpolation of operators*
2. *Geometry of Banach spaces*
3. *Stochastic evolution of large populations with applications in life sciences*
4. *Markov random fields with discrete underlying sets*
5. *Applications of Ramsey methods in Banach spaces*
6. *Functional analysis - geometry and properties of Banach spaces, fixed point theory*
7. *Differential equations - mathematical models of vehicular traffic*
8. *Complex analysis - Toeplitz operators*
9. *Probability theory and mathematical statistics - limit theorems, properties of order statistics and their estimators*
10. *Algebraic methods in cryptography*
11. *Didactics of mathematics*
12. *Applications of mathematics - dynamics of particle systems, problems of turbulent transport, diffusion in random environment*
13. *Analytic function spaces*
14. *Operators on analytic function spaces*
15. *De BrangeRovnyak spaces generated by non-extreme functions*
16. *Dirichlet spaces*
17. *Toeplitz and Hankel operators on the Hardy space*
18. *Gibbs states and phase transitions in Ising type models on hierarchical random graphs (prof. dr hab. Jerzy Kozicki and dr Alina Kargol)*



Scientific research conducted at the Institute of Physics

1. *Study of the physical mechanisms responsible for regulation of photosynthetic transport of energy and electric charge as well as the structural and dynamic properties of lipid membranes.*
2. *Mass spectrometry studies of the processes of formation of negative ions from organic molecules and studies of the composition of stable isotopes in geological and environmental samples.*
3. *Production, modification and investigation of the properties of materials: metals and their alloys, semiconductors, insulators, porous materials, polymers, silica, organic, photonics, composites and biological materials.*
4. *Computer simulations of the interaction of ions and plasma in connection with applications in tokamaks.*
5. *Research on new two-dimensional materials (silicene, antimonene and other Xenes) and one-dimensional structures in the form of metallic chains and nanostructures produced on vicinal silicon surfaces - structural, electronic, magnetic and optical properties.*
6. *Theoretical studies of new two-dimensional materials (silicene, antimonene and other Xenes) and one-dimensional structures: first principles calculations in the framework of density functional theory (DFT) and model calculations in the tight binding approach.*
7. *Research on the structure of the atomic nucleus and nuclear reactions, the theory of the condensed phase, electronic properties of condensed matter and nanoscopic structures, astrophysics and solar physics, and mathematical physics.*



Scientific research conducted at the Institute of Computer Science

- 1. Artificial intelligence and machine learning*
- 2. Parallel and distributed programming*
- 3. Software engineering*
- 4. Cybersecurity*
- 5. Bioinformatics and biomedical engineering*
- 6. Embedded systems*
- 7. Theoretical foundations of computer science*



Fields of study conducted at the Faculty of Mathematics, Physics and Computer Science

First degree studies

1. Mathematics
2. Mathematics in finance
3. Teaching Mathematics and Computer Science
4. Teaching Physics and Computer Science
5. Physics
6. Technical physics – engineering studies
7. Modern Materials Engineering – engineering studies
8. Radiation security – engineering studies
9. Computer science



Fields of study conducted at the Faculty of Mathematics, Physics and Computer Science

Second degree studies

1. Mathematics
2. Mathematics in finance
3. Teaching Mathematics and Computer Science
4. Teaching Physics and Computer Science
5. Computer science



Fields of study conducted at the Faculty of Mathematics, Physics and Computer Science

Engineering studies conducted in English

Technical physics – full-time first-cycle studies, engineering





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431 students are studying at the Faculty of Mathematics, Physics and Computer Science



The following Scientific Clubs operate at the Faculty:

- Koło Dydaktyków MaFil
- Studenckie Koło Naukowe Matematyków - Akademia Platońska
- Koło Naukowe Studentów Fizyki
- Studenckie Koło Naukowe Informatyki



Academic exchange programs operating at the Faculty:

- **Erasmus+** program
- **MOST** mobility program for students and doctoral students
- The German Academic Exchange Service **DAAD** program "Go East Sommerschulen"



Every year, the Faculty of Mathematics, Physics and Computer Science hosts many events to popularize science. These are among others:

1. Science shows
2. Educational workshops
3. Competitions
4. Thematic lectures
5. Scientific events

