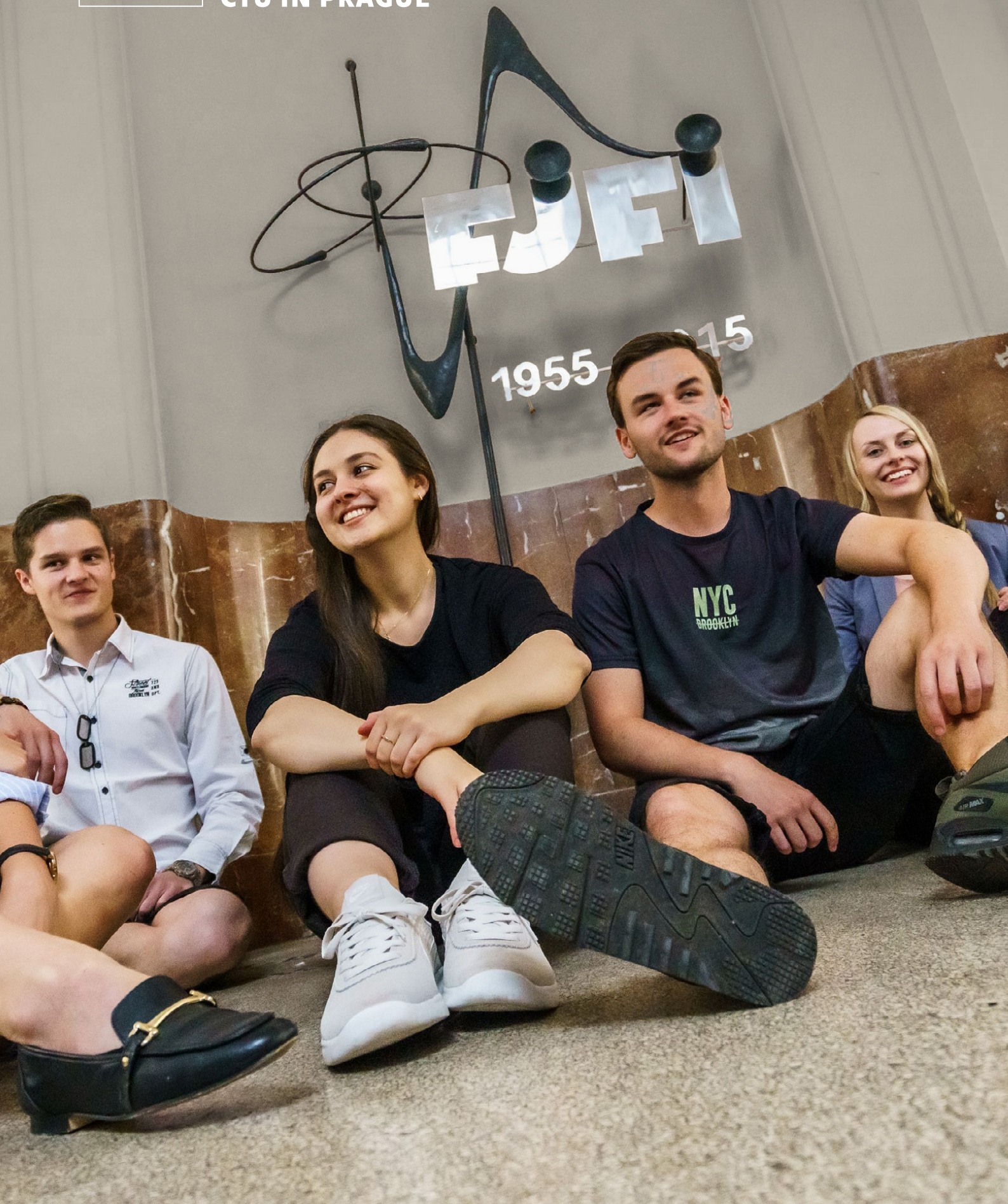
FACULTY OF NUCLEAR SCIENCES AND PHYSICAL ENGINEERING CTU IN PRAGUE

STRATEGY 2022+



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Introduction

The aim of this document is to formulate the issues and priorities of strategic importance for the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague. The Faculty will allocate a significant part of its financial resources acquired through the institutional support for the Long-term Conceptual Development of a Research Organization (LTCDRO) to support the development strategies as described below. This document will, at the same time, constitute a basis for developing the Faculty strategy of distributing the resources. Being in agreement with the CTU Strategy, the Faculty Strategy responds to the suggestions and comments made by the International Panel evaluating the Faculty activities in 2020.

Mission

The Faculty´s public image is being a modern and dynamically developing school oriented primarily towards advanced basic and fundamental research and up-to-date teaching techniques. For CTU, FNSPE serves as its base of natural sciences, i.e. mathematics, physics, chemistry, informatics, and their applications in engieering sciences and practice. The mission of the Faculty is to be supportive to CTU in its effort to enter the ranks of the world leading engineering universities. As regards its research performance, FNSPE has continuously been placed among the top European institutions. Within the Czech Republic, FNSPE has been striving to be the leading institution in nuclear and physics programmes and an integrating authority for the whole Czech Republic.

The aim of the Faculty is to integrate excellence in science and research with quality teaching which it has been developing over the years, to combine the skills and knowledge of experienced academics with the enthusiasm for excellent research of talented students, to focus attention on excellent research contributions to society, and to strenghten cooperation with industry.

FNSPE intends to be an effectively managed faculty having high-quality standards of all its activities. It offers motivating, demanding yet fair environment to its students and staff and supports good relations and cooperation among them. A significant proportion of its finances covering its operation comes from teaching and research and the Faculty intends this to be so in the future.

The past generations of distinguished scientists and professors paved the way for the Faculty´s high standards of today, which can now be used for its further development and achievements in science, education of the new generation, and cooperation with industry. The three pillars of the Faculty´s strategic development are as follows:

- excellent science,
- quality teaching,
- inspiring and fair environment for students and the staff.

1. Excellent science

CTU is a research university and FNSPE has long ranked among faculties with the highest scientific potential. Therefore its main priorities are to preserve the science and research-oriented character. An important example of a successful research project is the Centre of Advanced Applied Sciences (CAAS), a part of the Operational Programme Research, Development and Education – Excellent Science/Research. This project supports dynamic development in natural sciences not only at FNSPE but across the whole CTU. Within the former and other projects, e. g. the so called support of research infrastructures, the Faculty will focus on the latest trends in world research integrating young staff and students with prospects of long-term involvement with the Faculty.

For the future, FNSPE envisages that the proportion of publications and other creative outcomes of the Faculty´s students´ and PhD students´research will be higher. And also, the Faculty will support qualification development of the academics, will offer benefits to grants working on national and international research projects, and, last but not least, will support publication efforts.

FNSPE will be highly instrumental in advancing up-to-date-fields of research and will be highly supportive of involving more academic departments in the following fields, e.g. quantum technologies, quantum informatics, nuclear power engineering for the 21st century, accelerators, and space research. To reach high research quality, the Faculty will explore some ways of continued project funding through CAAS, in agreement with the Strategy of CTU. With a view to the achievements in solving the CAAS project, FNSPE´s ambiton is to be the leader in preparing a follow-up project for the Operational Programme Jan Amos Komensky integrating related topics of natural sciences across the faculties of CTU. Our Faculty will also invest its effort in greater involvement in projects of other financial supporters of basic research, such as the Czech Science Foundation, Ministry of Education, Youth and Sports etc.

With a view to the extent and demandness of the projects of research of excellence, it will be necessary to involve - to a much greater extent - also students from all course levels. The primary Faculty support will be given to the participating PhD and Master students, and, among others, also to those on the degree courses now under preparation (see below). For the projects mentioned above, a permanent team is inevitable even at a time of sustainability; therefore, the Faculty intends to make a part of the LTCDRO resources available for this period.

The Faculty staff will be systematic in promoting well known and important research findings beyond their community. The Faculty does not want to neglect research cooperation with industry, be it applied research or development and transfer of technologies. This effort was also praised by the 2020 International Evaluation Panel

concentrating on transfer of results to industry, FNSPE having received the status of excellence (the highest possible). The Panel´s general qualitative assessment was that:

"Overall, the Faculty is active in a number areas of research and innovation, and performs well in all aspects that could be evaluated. The work of the Faculty leads to considerable benefits to the society. Keeping in mind that the main mission of the Faculty of Nuclear Sciences and Physical Engineering is fundamental and basic research in the broad area of natural sciences, it is very impressive that in the M3 assessment, which is geared toward applied results and revenue generating, they came up near the top. If more emphasis were put on high-caliber publications, fundamental reserch, international recognition, and attracting international talent (students as well as faculty), they surely would be among the top two faculties, where they belong, among the overall very many strong ones at CTU. They are certainly on the right track".

Thus, the Faculty will be instrumental in submitting projects to the Ministry of Industry and Trade Ministry of the Interior, Ministry of Health, and Ministry of Defence, as well as active in searching for cooperation resources.

2. Quality teaching

The Faculty extends education in fields of modern applications of natural sciences, provided by experienced staff and based on cutting-edge technical and experimental facilities. In addition to regular contact classes, FNSPE intends to introduce up-to-date methods of distance and hybrid learning. Resources to cover teaching will be provided mainly by development funds of the Institutional Scheme and resources of the National Innovation Strategy.In order to boost motivation of the staff partly involved in the teaching process, the salary scale was subject to changes. Moreover, teaching performance will be included in the regulatr evaluation of the staff, see Chap. 3.

In te past years, the original degree courses in nuclear, nuclear chemical, and physical engineering, were gradually supplemented with mathematical engineering and engineering informatics programmes, and recently with radiological physics and thermonuclear fusion programmes. It was the well defined structure of FNSPE and its staff structure that made the extension of programmes possible. Newly accredited within the Operation Programme Research, Development and Education were three new degree courses: Quantum Technologies, Decommissioning of Nuclear Facilities, and Applied Algebra and Analysis. They will introduce more varied topics into the structure of education and respond to social demand. Within the frame of the National Innovation Strategy an inter-faculty programme on Quantum Informatics is now under preparation. Future projects to be designed within the Operational Programme Jan Amos Komensky will define even more degree programmes for the programme portfolio offered by FNSPE, and so the Faculty could be a natural programme guarantor for the Czech Republic for programmes such as accelerators or space technologies.

In the Czech Republic, FNSPE is irreplaceble, which is due to the fact that many degree programmes are offered nowhere else in the coutry. Promotional activity and recruitment of talented Czech and international students are some of the Faculty´s important responsibilities. Due to limited interest in engineering programmes among students in the Czch Republic, foreign students are expected to make a non-negligible total of students at FNSPE. Therefore all the newly introduced programmes will be offered in two languages - for self-paying students even in English. In the future they will be a lucrative source of income.To enhance motivation of Czech students for degree courses in English, regulations of the National Accreditation Bureau allow to offer programmes in English even within the Czech programmes. Students will also be motivated to enter exchange programmes (e.g. through the Erasmus Progamme) and join international research teams.

FNSPE has recently passed the process of accreditation of all the Bachelor and Continuation Master programmes, as required by the amended Higher Education Act. Most accreditations were granted for ten years. Nevertheless, even despite

the successfully acccredited programmes, FNSPE is ready to comply with its role of being the base of natural sciences for CTU and the leader in preparing the institutional CTU process of accreditation of physics, mathematics, and nuclear courses. FNSPE has already joined the institutional accreditation process at CTU, namely in informatics and biomedicine. Currently, preparations are under way for the accrediation process of doctoral studies at FNSPE.

Within the Operational Programme Research, Development and Education, in a strong national competition, the FNSPE staff was highly successful in gaining numerous projects for new study programmes, which significantly extends the offer of prospective fields of study. The new education programmes are very close to the traditional fields of science. However, they are so unique as to require quite specific curricula for their graduates to be able to enter the labour market and support the competitiveness of our industry.

FNSPE will earmark some resources for students to be able to take courses under the most favourable conditions, namely using up-to-date laboratoty equipment and highly efficient computer systems for their research, and will also invest in unique teaching facilities. Thanks to FNSPE, they can be utilized by all faculties of CTU and even other partners from the Czech Republic and abroad. These facilities will attract strong teams of researchers and teachers to investigate new issues. One of these well known facilities is the VR-1 Vrabec (Sparrow in English) Reactor. Not so well known, however, is the fact that it is being completed by additional infractructure, now under construction. This is so, because the present capacity of the Sparrow has reached its maximum and future programmes require more equipment. FNSPE therefore built a second nuclear reactor – a subcritical one. Another unique facility of the Faculty, the fusion reactor nicknamed GOLEM, has obtained extensive laboratory background facilities and can be added to the European system of education training specialistst in thermonuclear fusion. This is also how FNSPE enhances its research potential and capacity to educate specialists for modern power engineering technologies.

FNSPE envisages making use of its status of being CTU´s natural science base for mathematics, physics and chemistry and offers its graduates a chance of directly entering another course of study and possess teaching qualifications for secondary schools. This idea entails the accreditation project of the professionally-oriented course “Secondary School Teacher Training in Mathematics, Physics, and Chemistry“. This qualification will open more career opportunities for FNSPE graduates, and for students from other natural science faculties in the Czech Republic to gain qualified teaching competences. In the long-term view, this project should culminate in a recognized full teacher training degree programme

New financial resources will be essential for the Faculty for sustaning the high standards of its degree courses. In the future, the school will educate not only young natural scientists and engineers, but moreover, the graduates will be well aware of the importance of engineering sciences and their role and mission in society.

3. Challenging and fair environment

FNSPE supports development of skills and abilities of its staff.

FNSPE strives to create working environment of equal opportunities for all employees. Such an environment must offer equal chances for professional development to all employees and students. FNSPE has long been active to create competetitive yet friendly environment inspiring creativity. To facilitate the involment of newcomers, be it employees or students, in the faculty environment, manuals will be available to them, informing about all the standard situations they may face (medical examinations, requests for holidays, business trips, IT support, etc.).

1) The Faculty was successful in winning the HR AWARD and creates conditions to maintain it. Part of the projet is also the Career Regulations for the Employees, specifying and detailing the positions and scope of their rights, responsibilities and competences. Implementation of the Human Resourses Strategy for Researchers (HRS4R) includes revision of old documents and work on new ones outlying recruitment of researchers; the process is to be in agreement with the principles of the Code of Conduct for the Recruitment of Researchers and guarantee the applicants a transparent and undiscriminating selection process.

FNSPE, to some degree, continues to apply the principles of merit-based recruitment when admitting new employees, satysisfying at the same time the principles of equal opportunity. To secure the highest degree of transparency, any decision process will be reviewable.

2) In the framework of transparent and equal environment, students have at heir disposal Study and Examination Regulations and a Questionnaire on study issues at FNSPE. The Questionnaire can influence the quality of the teaching process and offer feedback. The respondents remain anonymous and can express their opinion and rate the teaching process without being apprehensive of facing any reprisal on the part of their teachers. In the future, FNSPE will try to engage as many students as possible in completing the Questionnaire. FNSPE has an active Students Union and tutors. Their objective is to assist and advise students on overcoming their study problems concerning their knowledge base, psychology and social relations. As for tutors, now one team of tutors runs classes, and another one acts as tutors.Thus students may be sure of having fair opportunities.This arrangement will be given strong support in the future. Morover, FNSPE will introduce a new authority officer, the ombudsman, to help students (and the employees) deal with situations and problems when they feel to have been improperly addressed and treated.

Besides the above activities, FNSPE pursues new ones supporting equal gender opportunities, such as to engage secondary school female students in science or initiate a discussion on the return of female students and young women

employees to work after maternity leave and join the student or working teams again.

3) Related to the support of further professional education of the teaching staff, FNSPE´s objective is to put together a team of experienced teachers and researchers competent to lecture and run classes in English. This scheme directly corresponds with the idea of opening degree courses in English. FNSPE offers its staff to attend English courses provided by the Department of Humanities and Languages.The course expenses are covered by Faculty resources and are open to everybody. Thus, again, the courses support the idea of equal opportunities.

In relation to the HR AWARD, CTU is introducing regular assessment of its staff of all ranks, i.e. the technical, administrative, research, and academic. FNSPE will adopt a reasonably adequate approach to this process and apply the evaluation principles in such a way as not to be an administration burden. The main purpose of evaluatons is motivating the employees. Evaluation will reasonably respect decision making based on facts and data.

With a view to the growing number of employees, both research, academic and the Dean´s Office administration staff and technicians, FNSPE have adopted more effective and up-to-date ways of management. Therefore, it is desirable to optimize their work and make it effective in all administrative departments of the Dean´s Office. The Faculty´s management has therefore restructured the Dean´s Office and had the results embedded in the FNSPE Statute. They grant a higher status to the vice-deans and empower them to direct the administrative departments within their responsibilities. To make full use of the employees´ efficiency it is necesary to appoint the head of each administrative department of the Dean´s Office. These steps will increase the productivity of labour, deccrease the administrative burden and avoid duplication of effort. Every head officer of the department will be informed in detail about the resposibilites of their employees and communication and key information flow among them will be easier. Every single head of department will assume responsibility for the department and/or employees, which will be important for disciplined work (distribution of tasks roles, checks, approval of work attendance, etc.). Continued importance will be given to upgrading employees´qualifications and competences in the Dean´s Office staff. The new administrative structure of the Dean´s Office will include the Department of Development, Department of Science and Research, Department of Student Affairs, Department of Public Reations, IT Department, Economic Department, Personal and Finance Department, Department of Project Management, and Facility Management. Departments established due to the new structure will require more staff adequate to the Faculty´s development in the past years and the newly added administrative and technical responsibilities FNSPE has to comply with.

FNSPE is a Czech school and is committed to educate the Czech society, providing education in the national langauage. However, to mainatain its high quality, it must offer quality education and do quality research that allow for comparison across universities and research institutions abroad. FNSPE will therefore be open to invite not only students but also academics. As imposed by the HR AWARD obligation, notifications of job openings and selection procedures will be available internationally. The administrative departments (i.e. of Student Affairs staff and others) will be competent in English and also all directives and instructions will be available in English.

Discussed by the Scientific Board of FNSPE and approved by the Academic Senate on June 20th, 2022.

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Chair of the Academic Senate

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