



**REPORT  
OF THE EXPERT PANEL  
ON THE  
RE-ACCREDITATION OF  
UNIVERSITY OF RIJEKA, DEPARTMENT OF PHYSICS**

**Date of preliminary visit: 19.4.2021.**

**Date of on-line re-accreditation: 20.4. -22.4.2021**

May, 2021

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## INTRODUCTION

The Agency for Science and Higher Education (the Agency) is an independent legal entity with public authority, registered in the court register, and a full member of the European Quality Assurance Register for Higher Education (EQAR) and European Association for Quality Assurance in Higher Education (ENQA).

All public and private higher education institutions are subject to re-accreditation, which is conducted in five-year cycles by the Agency, in accordance with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and subordinate regulations, and by following *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) and good international practice in quality assurance of higher education and science.

The Agency's Accreditation Council appointed an independent Expert Panel for the evaluation of University of Rijeka, Department of Physics.

Members of the Expert Panel:

- Prof. Joel Goldstein, Ph.D. H.H. Wills Physics Laboratory, University of Bristol, United Kingdom of Great Britain and Northern Ireland, Panel chair,
- Prof. Jaakko Akola, Ph.D., Department of Physics, Norwegian University of Science and Technology, Kingdom of Norway
- Assoc. prof. dr. sc. Emil Tafra, Faculty of Science, University of Zagreb, Republic of Croatia
- Marko Movre, expert from the business sector, XV Gymnasium, Zagreb, Republic of Croatia
- Dragana Ćoralić, student, Department of Physics, University of J.J. Strossmayer in Osijek, Republic of Croatia

During the on-line re-accreditation, the Expert Panel held meetings with the following stakeholders:

- Management,
- Self-evaluation Report Committee,
- Students,
- Heads of study programmes,
- Full-time teaching staff,
- Assistants and junior researchers,

- Heads of research projects,
- Representatives of the business sector, potential employers.

The Expert Panel drafted this Report on the re-accreditation of University of Rijeka, Department of Physics on the basis of University of Rijeka, Department of Physics self-evaluation report, other relevant documents, preliminary site visit and on-line meetings.

The Report contains the following elements:

- Short description of the evaluated higher education institution,
- Brief analysis of the institutional advantages and disadvantages,
- List of institutional good practices,
- Analysis of each assessment area, recommendations for improvement and quality grade for each assessment area,
- Detailed analysis of each standard, recommendations for improvement and quality grade for each standard,
- Appendices (quality assessment summary by each assessment area and standard, and protocol),
- Summary.

In the analysis of the documentation, preliminary site visit to the University of Rijeka, Department of Physics, online meetings and writing of the Report, the Expert Panel was supported by:

- Marina Grubišić, coordinator, ASHE,
- Goran Briški, interpreter at the preliminary site visit and during the online meetings, ASHE,
- Igor Opić, translator of the Report, ASHE.

On the basis of the re-accreditation procedure conducted, and with the prior opinion of the Accreditation Council, the Agency issues a following accreditation recommendation to the Minister for Higher Education and Science:

1. **issuance of a confirmation on compliance with the requirements** for performing the activities, or parts of the activities
2. **denial of license** for performing the activities, or parts of the activities
3. **issuance of a letter of expectation** with the deadline for resolving deficiencies of up to three years. A letter of expectation can include the suspension of student enrolment within a set period.

The accreditation recommendation also includes a quality grade of a higher education institution, and recommendations for quality improvement.

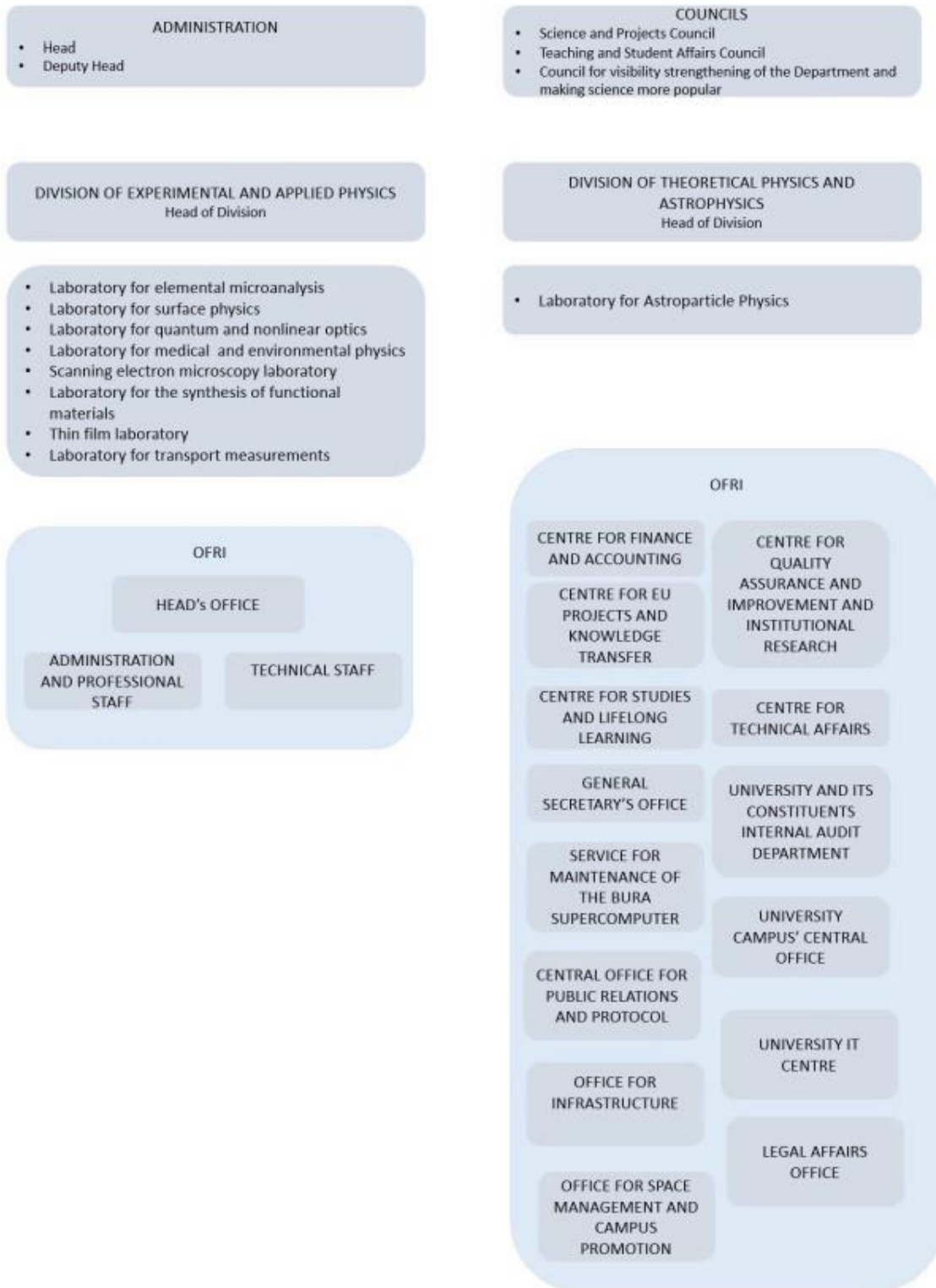
## **SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION**

**NAME OF HIGHER EDUCATION INSTITUTION:** University of Rijeka, Department of Physics

**ADDRESS:** Ul. Radmile Matejčić 2, Rijeka

**DEAN:** Associate Professor Marin Karuza, PhD

## ORGANISATIONAL STRUCTURE:



**STUDY PROGRAMMES AND NUMBER OF STUDENTS:**

<b>Study programme name</b>	<b>Full-time students</b>	<b>Part-time students</b>
Engineering and Material Physics (130), graduate university study programme, Rijeka	5	0
Physics (1125), undergraduate university study programme, Rijeka	76	0
Physics and Mathematics; specialisation in: Teaching (1126), graduate university study programme, Rijeka	6	0
Physics and Informatics; specialisation in: Teaching (1127), graduate university study programme, Rijeka	2	0
Physics (1129), graduate university study programme, Rijeka	39	0
Physics (1130), postgraduate (doctoral) university study programme, Rijeka	21	0
<b>Total</b>	<b>149</b>	<b>0</b>

**NUMBER OF TEACHERS:**

<b>Staff*</b>	<b>Full-time staff</b>	
	<b>Number</b>	<b>Average age</b>
Full professors with tenure	1	65
Full professors	4	55,5
Associate professors	4	54,25
Assistant professors	11	41,09
Scientific advisor (permanent/ with tenure)	-	-
Scientific advisor	-	-
Senior Research Associate	-	-
Research Associate	-	-
Teaching grades	3	44
Assistants	6	31,5

**ENROLLMENT IN REGISTER OF SCIENTIFIC ORGANISATIONS:**

Natural sciences



## **SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION**

Since its beginnings, the teaching of physics in Rijeka has followed the needs of society and has developed in accordance with these. In 1960, the education of physics teachers at the Vocational Pedagogy College within the Department of Natural Sciences began, which a year later evolved into the Department of Mathematics and Applied Physics. In 1964, a four-year study in Mathematics and Physics was set up, which is also the oldest four-year teaching study in Rijeka. The four-year course for teachers of mathematics and physics continued at the Industrial Pedagogy College, and from 1972 at the Faculty of Industrial Pedagogy through the Departments of Mathematics and Physics. Physics experiences changed again in Rijeka in 1977, when the Faculty of Pedagogy at the University of Rijeka was founded. This is where the study of physics took place through the Department of Physics, where professors of mathematics and physics, mathematics and informatics, and for a time, physics and chemistry were educated. After the Faculty of Pedagogy was renamed the Faculty of Philosophy in 1998, the Departments began to run educational programmes in Mathematics and Physics, Mathematics and Informatics, Physics and Polytechnics, and Physics and Informatics. In 2000, the Divisions of Applied, Experimental and Theoretical Physics were established at the Department of Physics. In 2005, studies were reformed in accordance with the Bologna declaration as part of the Faculty of Philosophy, and undergraduate and graduate double-major studies came to life. At the same time, an initiative was launched to separate the department from the Faculty of Philosophy, which resulted in the establishment of university departments on 17 th December 2007 following a decision by Rector Daniel Rukavina. With the establishment of university departments, undergraduate and graduate studies in mathematics and physics became university studies of the University of Rijeka, which the Department now conducts through two divisions, the Division of Theoretical Physics and Astrophysics and the Division of Experimental and Applied Physics, whilst the Chair of Educational Physics is in charge of the development and improvement of activities related to learning and teaching.

With the reform of studies in 2011, today's concept with five majors in undergraduate study has been fully revived, and since 2013, three teaching graduate studies as well as a new graduate study of research physics with four majors have been added to these. The educational vertical study was completed with the establishment of a doctoral study in physics in 2017, which is a guarantor of the quality and sustainability of the study of physics at SuRi.

## **BRIEF ANALYSIS OF THE INSTITUTIONAL ADVANTAGES AND DISADVANTAGES**

### **ADVANTAGES OF THE INSTITUTION**

1. An excellent staff/student ratio
2. Modern facilities and research equipment
3. Highly competent staff, who are maintaining robust, high-quality research output
4. Well-situated, with easy access to Zagreb, Trieste, Ljubljana, and other potential collaborating institutes.

### **DISADVANTAGES OF THE INSTITUTION**

1. Heavy teaching workload for staff
2. Low level of national and international research project funding
3. Low level of staff mobility
4. Lack of career development planning for staff and PhD students
5. Insufficient engagement with certain key stakeholders, specifically teaching mentors and alumni
6. Insufficient and/or erratic provision of computing and transferable skill training

## **LIST OF INSTITUTIONAL GOOD PRACTICES**

### **EXAMPLES OF GOOD PRACTICE**

1. Excellent communication between staff and students
2. Continual improvement of study programmes from student feedback and self-evaluation
3. Engagement with the wider community through outreach, industrial collaboration and lifelong learning
4. Use of national returnee scheme to increase staff numbers and expertise
5. Newly implemented PhD programme that is flexible, supportive and encourages mobility through partnerships with external partners

## **ANALYSIS OF EACH ASSESSMENT AREA, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH ASSESSMENT AREA**

### **I. Internal quality assurance and the social role of the higher education institution**

#### **Analysis**

The internal quality assurance process is well-defined and driven by the university and departmental strategies and action plans. The quality of self-assessment and improvement for teaching affairs is particularly impressive with a standing committee with representation from a variety of stakeholders and clear evidence of continual improvement. There are also well-defined policies on ethics for both staff and students, with procedures in addition to those at university level. Fortunately, these procedures have been little-exercised.

The department has implemented many of the recommendations from previous university and ASHE reviews, but some are still outstanding. One example of this is that there still does not seem to be effective communication with alumni. Communication with the public is, however, generally of a high standard with a plethora of information available on websites and via Facebook, and high-impact outreach activities. The department has also started to engage well with local and national industry, through the provision of both services and student placements.

The department offers two well-designed lifelong learning programmes, which unfortunately do not seem to be attracting much interest.

#### **Recommendations for improvement**

We recommend that alumni and teaching mentors should be included formally in the teaching quality assurance process. Full implementation of the 2015 re-accreditation report also needs to be concluded. We believe that communications with alumni (both at department and university level) should be reviewed, and a wider range of popular social media should be used. Engagement with local and national industry should be accelerated, and lifelong learning impact should be improved by offering existing physics courses within the Supplementary Pedagogical and Psychological Education for Teachers programme offered by the Faculty of Humanities and Social Sciences.

**Quality grade:** High level of quality

## II. Study programmes

### Analysis

Based on the documents and discussions at the evaluated university, the members of the committee concluded that the general goals of all study programmes are in line with the mission and strategic goals of the University, with SuRi creating flexible academic profiles. The university thus educates experts competitive in the national and international labor market, which is confirmed by numerous examples of employment in domestic and foreign scientific and educational institutions, as well as the comments of labor market representatives during the interviews. All OFRI study programmes are based on clear learning outcomes and as such are aligned with the mission and objectives of OFRI and SuRi and with the level of qualification acquired. OFRI study programmes are systematically and regularly developed, continuously amended and supplemented. They show continuous monitoring, revision and improvement of the teaching process, and methodological and terminological harmonization of learning outcomes with the requirements prescribed in the relevant documents. Improvements to study programmes are also considered based on feedback from alumni and external stakeholders (e.g., employers). All changes and additions to the study programmes are archived in both the SuRi and OFRI and are publicly published on the OFRI website where the current versions of all OFRI study programmes are available. SuRi does not perform the same or similar studies as those conducted by OFRI, and planning and proposing new study programmes includes analysis of justification, capacity and compliance with strategic goals at the local and state level and other needs in society, as evidenced by the presented documents. The expert committee determines how the higher education institution harmonizes ECTS credits with the actual student workload based on the analysis of stakeholder feedback in the teaching process. OFRI enables learning and acquisition of skills through student internships at all graduate studies (educational and professional).

### Recommendations for improvement

In order to ensure the full capacity of study programmes and to continue the trend of education of competitive professionals, it is proposed to increase engagement in encouraging student enrollment in study programmes.

A clear vision of the sustainability of study programmes and a final decision on the suspension or closure of certain study programmes that have been paused. Strengthen students' social and presentation skills (transferable skills), integrate them into as many courses as possible and develop modern digital competencies (programming) for students, as early as possible.

Expanding and strengthening the acquisition of research experience in final and graduate theses and completing the implementation of regular professional practice in all study programmes.

The involvement of other stakeholders (alumni, labor market representatives, teaching practice mentors) is recommended in the established Councils of the Department in order to further develop communication on the quality, implementation and needs of study programmes.

**Quality grade:** High level of quality

### **III. Teaching process and student support**

#### **Analysis**

Admission criteria or criteria for the continuation of studies are published, applied and in line with the requirements for the study programmes. Students are familiar and satisfied with with study programmes, their obligations as well as opportunities and possibilities. OFRI gathers relevant information from students through surveys and uses it to ensure even higher quality as well as a way of communication with students. Various modes of programme delivery are being used at OFRI, such as lectures, seminars, practicums, workshops, e-learning, etc. Students with disabilities are provided with adjustment and assistance in the organisation of studies. Student-mentor programme is available for first year undergraduate students. OFRI also ensures support to students from vulnerable and under-represented groups. All of the OFRI students are given the opportunity to gain international experience, but not many use it. All incoming Erasmus students have the right to attend Croatian language courses at the Rijeka School of Croatian Studies at the Faculty of Philosophy. The criteria and methods for evaluation and grading are aligned with the teaching methods used and it has been confirmed by the students in the surveys taken. Students that finish any of the studies at OFRI find a job pretty fast and have plenty of possibilities to find a workplace. All of the OFRI students are ensured educational, advisory, informational and research activities in order to develop career management skills.

#### **Recommendations for improvement**

Continue with the practice of improving enrolment criteria for studies were students encounter difficulties in achieving learning outcomes. Encourage all first-year undergraduate students to use student-mentor programme. Implement necessary measures to restart suspended study programmes, or if it is not feasible to do so, abolish them completely. Encourage and facilitate more incoming mobility. Continue with

professional education of professors. Inform future students more on employability and opportunities after the degree in Physics. Improve the work of Alumni Club and contact with former students, include them more in OFRI's work. Continue with the activities done to promote OFRI and attract more students.

**Quality grade:** High level of quality

#### **IV. Teaching and institutional capacities**

##### **Analysis**

Coverage of study programmes with own staff is within the requirements. The ratio of students and full-time teachers at OFRI is such that it ensures a very high quality of study. But there is a significant difference between the ratio of the number of students and professors on OFRI study programmes and the teaching that OFRI staff conducts at other SuRI constituents. Teaching workload is significant, it is mostly in line with relevant legislation and policies, but in some cases, it is above the norm, and our impression is that this heavy teaching workload can have negative effect on staffs' scientific activities. Teachers are qualified for the courses they deliver. The employment of teaching staff is carried out in accordance with legal regulations, and the offer of vacant positions and appointments are conducted in accordance with the OFRI Strategy. Student evaluation of the teacher's work is also taken into account. OFRI does not have specially prescribed competitive criteria for selecting excellent candidates, and excellence is assessed on a case-by-case basis. OFRI Teachers have an opportunity to attend a lifelong learning program which enables university teachers to acquire the basic knowledge and skills needed for higher education, and are offered mobility opportunities. Level of scientific and professional mobility of the staff is quite good, but the level of teaching mobility is quite low. So far there have been no requests for a sabbatical year, due to the significant teaching workload.

OFRI lecture halls cover approximately 400 m<sup>2</sup>. In addition to this, teaching also takes place in practicums, teaching laboratories and the IT classroom. Furthermore, equipment used in scientific research is also available to students. In our opinion, one of the major advantages of OFRI are modern facilities and research equipment with plenty of space for expansion. The library and library equipment, ensures everything that is required for study, research and teaching. Management of OFRI has taken various measures to stabilize finances, and eliminate debt from previous years. Number of physics students is decreasing at undergraduate and graduate level, which has negative effect on the finances, because of the lower income from tuition fees, but newly established Doctoral Study of Physics generated some increase in this type of income. OFRI also generates funds through national and international projects, through collaboration with the industry sector and the local community, but at this time, there is only one scientific

project active funded by Croatian Science Foundation, and one project funded by European Social Fund.

### **Recommendations for improvement**

The main recommendation in this area would be to lower the teaching workload, but it is not easy to fulfil it, because even if it would be completely in line with relevant legislation and policies, it would still be high enough to have negative effect on scientific work. Furthermore, the ability to hire more staff is also quite limited by the laws and regulations. So far, OFRI has used national returnee scheme to increase staff numbers and expertise, and we strongly recommend the continuation of this practice. In teacher recruitment, OFRI could consider proscribing additional competitive criteria in addition to the prescribed national minimum conditions, and put more emphasis on candidate's successful projects. Also, OFRI management should envision additional measures to encourage and facilitate sabbaticals and other mobility opportunities.

We recommend that the new OFRI development strategy should include plans for acquiring major new infrastructure, and maintaining the existing infrastructure. To ensure a long-term financial sustainability, project activity should be increased. Also, some of the equipment in practicums seems outdated, and should be replaced/updated. We recommend continuation of collaboration with the industry sector and the local community, and further acceleration in that aspect.

**Quality grade:** High level of quality

## **V. Scientific/artistic activity**

### **Analysis**

The Department has maintained a robust and high-quality scientific output. Despite the heavy teaching load, the OFRI personnel are active in publishing their results in scientific journals of high quality. The research output of the Department is far above the SuRI average with balanced contributions from all research groups. OFRI promotes scientific activity by actively rewarding the groups and individual staff members for their merits, and the quality and number of publications contributes consistently towards promotion. The staff participation in scientific and professional conferences and their organization is fair.

OFRI has had a development strategy since 2018 to promote public activity and co-operation with the business sector and local community. The Department also monitors the changing needs of the society and takes these into account while carrying out harmonisation in its study programmes. OFRI staff has applied successfully for the internal research funding at SuRI and have currently eight projects running. The Department has developed significantly its knowledge and technology transfer processes

both internally and in collaboration with SuRi. Furthermore, OFRI performs research for local clients which generates further revenue.

The Department's project portfolio is good but there are also places for improvement. The employees apply for national and European funding calls (although activity on the latter has been low), and currently OFRI holds 2 scientific and 6 professional projects. All scientific and teaching staff members participate in at least one project. The staff members have been invited as visiting lecturers nationally and internationally, and they have been active in conference organization. Two employees are members in the editorial boards of scientific journals. The OFRI professors and associates are not participating in evaluation panels for European funding.

OFRI has a clear development strategy since 2018. The corresponding objectives are formulated in annual action plans, and the implementation of the strategy is monitored based on well-established procedures. The two most important goals consider research groups (creation and strengthening) and infrastructure (operation). The interviews revealed that there are still issues with the former in terms of achieving the critical size in some groups. The experimental infrastructure at OFRI is very good, and there is a strategy for its strengthening and modernization. However, the strong dependence on external funding cannot be considered as a sustainable financial model. The OFRI computing infrastructure is satisfactory but needs modernization. The Department has been very successful in building up the staff numbers and using the national returnee scheme, but the number of international employees remains very low.

OFRI uses its research infrastructure efficiently, as evidenced by the number of publications. The OFRI laboratories are also used for teaching and preparation of graduate theses. Graduate and postgraduate students take part in the research activities, but there has been very little student involvement in the co-operation with the business sector and local communities. The staff members take actively part in the student supervision in the fields of their expertise. There is less staff available in some fields of physics, which makes the PhD students more dependent on a single professor.

### Recommendations for improvement

We suggest that OFRI should develop a complementary strategy for scientific quality-assurance upon promotion procedures in parallel with the national standards. The Department should enforce an open-access (OA) policy for its publications by setting a rule that access to OA versions must be included in the CROSB database. Strategies for increased participation (and visibility) in international scientific workshops and conferences should be developed. OFRI could monitor its activities in sustainable development and draft a strategy for dissemination and further endorsement of new projects.

We strongly recommend that the Department should improve its measures for motivating and supporting its staff members in participating EU calls. The staff members should actively engage in evaluation panels of international funding offices, starting from those of the European Union. The personnel should aim for increased presence in editorial boards.



A new strategy should include plans for acquiring major new infrastructure, maintaining the existing infrastructure and achieving critical mass in more research activities. The Department should pay particular attention to its computational infrastructure (workstations, Bura supercomputer) and its modernization. Further, OFRI should increase its industrial collaboration, and especially on a larger geographical radius, and consider increasing student involvement in these activities. The strategy should include action plans for ensuring two qualified supervisors for each PhD student from their field of study.

**Quality grade:** Satisfactory level of quality

## **DETAILED ANALYSIS OF EACH STANDARD, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH STANDARD**

### **I. Internal quality assurance and the social role of the higher education institution**

#### **1.1. The higher education institution has established a functional internal quality assurance system.**

##### **Analysis**

Quality assurance follows departmental and university strategies, most recently the OFRI 2018-2020 Development Strategy (the new SURI strategy was approved during this review). The implementation of these strategies is formalised in the 2019-2024 Action Plan.

The institution has established a well-organised self-evaluation and quality assurance procedure for teaching affairs. There is a standing committee that meets several times a year, with wide representation including administration, teaching staff, students and external stakeholders. It receives input from a number of sources including regular student satisfaction surveys, graduate feedback surveys and peer review. There are established procedures for implementing recommendations and taking remedial action including staff training. There is clear evidence that this cycle is resulting in improvements in the quality of teaching and the experience of students, for example in the harmonisation of ECTS credits.

##### **Recommendations for improvement**

- Include alumni and teaching mentors formally in the teaching quality assurance process.

**Quality grade:** High level of quality

#### **1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.**

##### **Analysis**

The institution has received evaluations both from the University (2014, 2019) and ASHE (2015). Many of the recommendations from these were included in the Action Plan and have been implemented, such as starting a PhD programme and improving cooperation with local industry. Other recommendations are still outstanding, including improving the engagement of alumni and engaging staff with EU funding reviews.

### Recommendations for improvement

- Continue full implementation of the 2015 re-accreditation report

**Quality grade:** Satisfactory level of quality

### **1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.**

#### Analysis

SURI has well-defined codes of ethics for both staff and students, and key aspects are included in the 2018-2020 Strategy. An Ethics Committee has been established within OFRI (in addition to the university student ombudsman process) to investigate violations of these codes, as well as to advise on ethical issues. There have been no reported incidents of intolerance or discrimination, and only one case of a disciplinary procedure for a student (which was settled within the department).

**Recommendations for improvement** None

**Quality grade** High level of quality

### **1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).**

#### Analysis

The OFRI website contains a wide variety of information on its activities in both Croatian and English. This information is of interest to a variety of stakeholders, including prospective undergraduate, graduate, postgraduate and lifelong students. There is also a well-used Facebook page.

The department has an excellent outreach programme, involving targeted events for school-age students as well as a regular radio programme and involvement in local science festivals.

Both OFRI and SURI have alumni organisations, but it is not clear how effective these are at maintaining communication with OFRI graduates.

### Recommendations for improvement

- Review communications with alumni, both at department and university level
- Consider introducing new channels of communication through a wider range of popular social media (Twitter, Instagram etc.)

**Quality grade:** High level of quality

### **1.5. The higher education institution understands and encourages the development of its social role.**

#### **Analysis**

The department engages with the local and wider community in a number of ways. The outreach programme (mentioned in 1.4 above) increases understanding and appreciation of science in the general public, as well as specifically encouraging school children to consider pursuing STEM subjects. OFRI also engages with local and national industry by offering analytical services and organising student placements, although this latter project has yet to be fully developed. Lifelong learning programmes also contribute to this area and are described below.

#### **Recommendations for improvement**

- Accelerate engagement with local and national industry.

**Quality grade** High level of quality

### **1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.**

#### **Analysis**

OFRI offers two lifelong learning programmes to enable students to acquire missing knowledge and skills in physics and mathematics. One is nominally for future graduate students, the other specifically for primary school teachers. It is also involved in providing a programme on laboratory testing of materials. These programmes have all been developed in consultation with external stakeholders including prospective employers and professional organisations. Unfortunately, the application rate is very low with less than one student per year.

#### **Recommendations for improvement**

- Offer relevant, existing courses (e.g. Laboratory Experiments for Physics Teachers, Training Methods and Strategies in Physics Teaching I&II, Teaching Practice in Physics) as part of the SPPE (Supplementary Pedagogical and Psychological Education for Teacher) lifelong learning programme offered by the Faculty of Humanities and Social Sciences.

**Quality grade** Satisfactory level of quality

## II. Study programmes

### **2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.**

#### Analysis

On the basis of documents submitted and meetings held during the site visit, the Panel members concluded that the general goals of all study programmes are in line with HEI's mission and strategic goals, whereby the University of Rijeka creates flexible academic profiles, stimulates the development of natural sciences and its link with humanities, development of ICT competencies, development of technologies and continuous improvement of staff professional development at all levels. Recent analyses of the necessary capacities for the implementation of appropriate study programmes and study programmes' justification with regard to social and economic needs are included in the project documentation of two projects in which OFRI participated as a partner, or participates as a project holder. The higher education institution educates experts that are competitive on the national and international labour markets, as attested by a number of examples of employment in Croatian and foreign research and higher education institutions, and corroborated by labour market representatives during the meetings.

#### Recommendations for improvement

In order to ensure the full capacity of study programmes and continue the practice of educating competitive experts, the Panel recommends that additional efforts are invested in encouraging student enrolment.

At the level of the University of Rijeka, the Panel recommends to re-implement the incentive project funded by the Ministry of Science and Education to fulfil the strategic goals of the University on the basis of the Agreement on Full Subsidy of Participation of Full-time Students in the Costs of Study in the following years.

**Quality grade:** High level of quality

### **2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.**

#### Analysis

All OFRI study programmes are based on clear learning outcomes and as such aligned with the mission and objectives of OFRI and the University of Rijeka, as well as the level of qualification acquired. Continuous changes and amendments to study programmes

ensure that programmes are up-to-date. Following the panel recommendation from the 2015 re-accreditation, OFRI established the Council for Teaching and Student Affairs. In addition to their coordination, HEI is currently evaluating the alignment of learning outcomes at the level of programmes and courses. Although the CROQF Register does not yet include occupational and qualification standards that correspond to OFRI study programmes, the harmonisation of study programmes of teacher profiles with the occupational and qualification standards developed within STEM is currently underway. The link between the learning outcomes and appropriate competencies, both for continuation of studies and individual/society needs is provided in the Descriptions of OFRI study programmes. In addition, and with regard to study programmes of research profiles, four occupational standards (engineer of physics, graduated engineer of computational physics, graduated engineer of environmental physics, medical physicist) and three qualification standards (bachelor of physics, master of physics, master of research physics) are currently being developed within FizKO project, which will soon complete the process of harmonization of all study programmes.

#### Recommendations for improvement

Although HEI actively monitors whether programmes are up-to-date and continuously changes and amends them, the recommendation - based on the suggestion of the labour market representative - is to strengthen students' social and presentation skills (transferable skills), integrate them into as many courses as possible, and develop modern digital competencies (programming) for students, as early as possible. It is also recommended to ensure that as many research competencies as possible are acquired at all study levels of study.

**Quality grade:** Satisfactory level of quality

### **2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.**

#### Analysis

Based on student, alumni and teacher satisfaction survey, the higher education institution ensures the achievement of intended learning outcomes of the study programmes it delivers. The minutes show that there is a continuous monitoring, revision and improvement of the teaching process. All OFRI teachers are instructed on how to revise, amend and harmonise the learning outcomes, confirmed by the fact that a workshop was organised for all OFRI teachers. The submitted documents shows that HEI conducted methodological and terminological harmonization of learning outcomes with the requirements prescribed by relevant regulation.

### Recommendations for improvement

Continue to train teachers on learning outcomes and their implementation and analysis.

**Quality grade:** High level of quality

## **2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.**

### Analysis

OFRI study programmes are systematically and regularly developed, which is evident from the recorded changes and amendments to study programmes. Improvements to study programmes are also based on feedback from alumni and external stakeholders (e.g., employers). Records of all changes and amendments to study programmes are archived at both SuRi Centre for Studies and OFRI, and are published on the OFRI website. Amendments to study programs, i.e. development activities at the level of study programs, are also influenced by communication with the Croatian Employment Service, the Education and Teacher Training Agency, the participation of representatives of the OFRI management in the work of the SuRi Centre for Studies expert council, while state statistics are monitored and potential employers are contacted (e.g. principals of schools, hospitals, institutes,...). SuRi does not conduct the same or similar studies as those conducted by OFRI, and planning and proposing new study programs includes analysis of justification, capacity and compliance with strategic goals at the local and state level and other needs in society, as evidenced by the presented documents. Current versions of all OFRI study programmes are available on the website.

### Recommendations for improvement

It is recommended to include other stakeholders (alumni, labour market representatives) in the established OFRI councils, in order to further develop communication on the quality and implementation of study programmes.

Adopt a plan for the sustainability of study programmes, as well as a final decision on continuing or discontinuing certain study programmes that have been temporarily suspended.

**Quality grade:** High level of quality

## **2.5. The higher education institution ensures that ECTS allocation is adequate.**

### Analysis

The Expert Panel established that the higher education institution harmonizes ECTS credits with the actual student workload based on the analysis of stakeholder feedback. As a formal mechanism for monitoring the quality of study programmes, one which was recommended by the expert panel in June 2015 re-accreditation of OFRI, HEI conducted a survey entitled Comparison of ECTS course credits with the actual student workload. The results of this survey, conducted with students at all levels of study, are publicly available.

### Recommendations for improvement

There are no specific recommendations; activities are regularly carried out and ECTS credits are regularly analysed and harmonised.

**Quality grade:** High level of quality

## **2.6. Student practice is an integral part of study programmes (where applicable).**

### Analysis

OFRI enables learning and acquiring skills through student internships at the level of (all) graduate study programmes (teaching and professional). HEI developed internship plans related to the real sector, with the aim of achieving greater student satisfaction and enhance their qualifications. OFRI exercise rooms are located in primary and secondary schools in the city of Rijeka, which was approved by the Republic of Croatia's Ministry of Science and Education. Unlike methodological practice, professional internship can be carried out in institutions, companies, associations and other legal entities in Croatia and/or abroad (so-called professional internship coordinators), with which OFRI has concluded a collaboration agreement related to the organisation of professional internship. Based on the Subject description, coordinators of courses in methodological practices draft implementation plans and programmes. Among other things, they list the intended learning outcomes related to student internships, and elaborate the grading system in detail. The Professional internship course also has, among other things, defined learning outcomes and student obligations, and an elaborate procedure for student evaluation in the Subject description.

### Recommendations for improvement

Formally, all the conditions have been met, the professional practice has just begun, but due to the COVID-19 restrictions, it has not yet been fully implemented. Internship of students of teaching specialisations is performed regularly. Recommendations relate to maintaining this opportunity, expanding it and placing more importance on practical



work across all non-teaching study programmes. The Panel would especially like to emphasise the need of strengthening and expanding the graduate thesis stage, by enabling longer student internship and research for the final/graduate exam.

**Quality grade:** Satisfactory level of quality

### III. Teaching process and student support

#### **3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.**

##### **Analysis**

The criteria for admission or continuation of studies are published and consistently applied. Information for enrolment or continuation of studies is available on the OFRI website. The surveys' that are being regularly taken by students' support this statement and show their satisfaction. This was also clear from the conversation with students during the reaccreditation. Criteria is communicated to students as well as all other staff. According to survey taken by graduate students in 2017/2018 academic year the OFRI students are on the fourth place at the entire SuRi in being informed, counselled and supported by professors and administrative staff during the studies. The procedure of recognition of prior learning is regulated by The Ordinance on the Recognition and Evaluation of the SuRi Prior Learning. The OFRI Council and expert commissioners issue opinion on applications. A level of mathematics in matura exams provides the necessary prior knowledge in accordance with the requirements of the undergraduate study of Physics. The enrolment criteria for the IFM graduate study were improved in 2020 due to student difficulties in achieving learning outcomes in physics subjects. Candidates from professional studies have the obligation to enrol in the "Programme to acquire any missing knowledge, skills and competencies necessary for enrolment in the graduate university study of Engineering and Physics of Materials".

##### **Recommendations for improvement**

We recommend that the department continues to review the need for the various study programmes, since some of them have been temporarily suspended. They need to work towards ensuring the full capacity of study programmes. We also recommend the continuation of practice of improving enrolment criteria for studies were students encounter difficulties in achieving learning outcomes. The doctoral study programme is new, so that a full analysis cannot be made at this time, but we recommend in the future

to analyse learning outcomes and achievements of finished PhD students and consider if there is a need to change enrolment criteria.

**Quality grade** Satisfactory level of quality

### **3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.**

#### **Analysis**

Procedures for monitoring student progress are clearly defined and available on the OFRI website on the beginning of each academic year. The pass rate of students and their progress in the Undergraduate Study is being systematically monitored and analysed. The number of graduate physics professors is also being analysed. Results of the student pass rate on the Undergraduate study of Physics from the first to the second year of study analysis have the aim of increasing the success of studying. Students have the possibility to get informed by their student-mentors and get the necessary help and advice. Also, OFRI graduate students hold demonstrations for first year undergraduate student in some mathematical subjects. Students coming from schools offering lower physics education are provided the necessary prior knowledge within the optional courses. According to Amendments to the graduate study of Physics from 2018 students have the possibility to enrol in elective courses from other study programs that are carried out on the components of SuRi. Popularisation activities and appearances in the media are some of the clear and defined measures to motivate student enrolment in mathematics and physics, with the aim of presenting them to bodies at a national level.

According to surveys analysis OFRI is the third best rated component of SuRi in terms of satisfaction with the study programme, the best rated component in terms of satisfaction with the content of most compulsory courses, the second best rated component in terms of satisfaction with teaching and teaching methods, the best rated component in terms of satisfaction with professors, the third best rated component with motivation for further learning, and the fifth best rated component in terms of satisfaction with the study experience. Due to lack of interest, study programmes Undergraduate study of Physics – major of Philosophy, Graduate study of Physics and Philosophy, Graduate study of Physics - major of Atomic and Molecular Physics, Graduate study of Physics and Philosophy, have been temporarily suspended.

#### **Recommendations for improvement**

Include all first-year undergraduate students in student-mentor programme and encourage them to use it more. Implement necessary measures to restart suspended study programmes, or if it is not feasible to do so, abolish them completely.

**Quality grade:** Satisfactory level of quality

### **3.3. The higher education institution ensures student-centred learning.**

#### **Analysis**

The higher education institution encourages various modes of programme delivery, in accordance with the intended learning outcomes. Some of which are lectures, seminars and workshops, exercises, e-learning, practicum classes, independent assignments, use of multimedia and network, laboratory work, project teaching, mentoring, etc and can be found on the website.

Teaching methods used at OFRI encourage interactive and exploratory learning, problem solving and creative and critical thinking. It can be mostly noticed in laboratory exercises and practicum courses where students work solve practical tasks and real physical problems. According to the survey from 2017/2018 OFRI is the second-best rated component at SuRI in terms of student satisfaction with teaching and teaching methods. Students evaluate teaching and teaching methods through ISVU surveys after each semester in an academic year for all courses they have attended. As part of the *Lifelong Learning Programme in the field of improving the teaching competencies* of CON at the SuRI's Faculty of Philosophy, in the last five years, four OFRI professors have undergone the process of collaborative assessment. Aim of these activities is to improve the quality of teaching and teaching methods, what means changing ways of teaching according to the results gained through the activities.

From 2017 to 2020 adjustment and assistance in the organisation of studies was provided to several students, one of who was a student with 100% disability. Regarding to that it is visible that OFRI works according to Protocol for the Care and Monitoring of Students with Health Problems, Disabilities and Chronic Diseases.

The higher education institution ensures the use of state-of-the-art technologies to modernise teaching. Over the last five years some new technological solutions, educational and communication platforms, network applications, etc have been implemented. An example is Merlin platform, where all courses can be found as well as materials from previous years and a range of possibilities for online learning. Two classrooms are equipped for streaming lectures and hybrid or remote model teaching, and Google Meet and Zoom are being used for online classes. CORSIKA, Dusty, Tlusty, and Unifit are the software tools used for simulations and modelling of physical processes. Students use advanced programming tools such as Python script programming language and Mathematica, object-oriented programming languages such as C ++. OFRI has its own server computer Prelog and a supercomputer Bura, which is also being used by students for more complex computing.

Professor availability and commitment is evident through the high scores on ISVU student surveys. OFRI is the best rated institution at SuRI during the 2017/2018 academic year,

and in 2016/2017 it was highly positioned. Through a conversation with students, it was visible that they are really satisfied with their professors as well as with teaching methods. And since there are no many students at OFRI the atmosphere and relationship between professors and students is pleasant and friendly.

Student representatives are included in working bodies for the evaluation of study programmes, the educational process and the functioning at OFRI. Students also have a representative in the Counselling for Teaching and Student Affairs.

### Recommendations for improvement

According to student they don't really work with programming tools so much and it would be necessary to improve that and implement even more in teaching.

**Quality grade:** High level of quality

## **3.4. The higher education institution ensures adequate student support.**

### Analysis

The higher education institution provides guidance on studying and career opportunities to students. First year undergraduate students have student-mentors (third year of undergraduate and graduate studies), but they don't really seem to use that programme and opportunity. The SSC Career Office offers all students and OFRI alumni the possibility of individual and group counselling with the aim of supporting the development of career self-concept, setting career goals, researching career opportunities and establishing contacts with potential employers.

The higher education institution has established functional procedures for student career guidance, psychological and legal counselling, support to students with disabilities, support in outgoing and incoming mobility, and library and student administration services, at university or faculty level and students are informed about them. Both students and alumni have the possibility to participate in educational, advisory, informational and research activity. Students can seek legal advice from the Office of the Student Ombudsman. Erasmus coordinator at OFRI is available for students to inform on mobility programmes. Students are also satisfied with the amount of books disposable in the library for them to use.

Student support is tailored to a diverse student population (part-time students, mature students, students from abroad, students from underrepresented and vulnerable groups, students with learning difficulties and disabilities, etc.), and it can be seen in several examples. Over the past five years, a study has been facilitated to: (i) female student with health problems, (ii) a male student who was tolerated for absenteeism due to health problems, (iii) a few students with health problems, who were allowed to suspend their studies after the student doctor's recommendation and in agreement with the Office for

Students with Disabilities, (iv) several students of lower socio-economic status, who were allowed to pay tuition fee in two instalments upon request.

In accordance with OFRI Rules and Regulations on the internal structure and structure of work places OFRI employs a total of eight employees who make up the qualified and committed professional, administrative and technical staff. Since 2015, a number of educational courses for administrative and technical staff have been carried out, e.g., the UniRi workshop for work on the OFRI Intranet portal Strategy and Action Plan, a seminar on the lifelong education of employees of public institutions operating in the field of science and higher education organised by the Faculty of Law, a preparatory course in English for working with students within the Medical Physics and Biophysics course, a professional development programme for laboratory assistants within Erasmus + mobility at the Faculty of Science (Rzeszow, Poland), etc.

### Recommendations for improvement

Encourage first year undergraduate students to use student-mentor programme more and help them out through their undergraduate studies. Also, it would be necessary to improve counselling and help, first of all graduate and PhD students in the development of career self-concept as well as setting career goals and contact with potential employers, since it appeared to be lacking during conversation with students.

**Quality grade:** Satisfactory level of quality

## **3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.**

### Analysis

The higher education institution monitors various needs of students from vulnerable and under-represented groups. Students are introduced to the existence of the SSC, which includes the Psychological Counselling Centre, the Office for Students with Disabilities and the Careers Office, as well as to the coordinator for OFRI's vulnerable and underrepresented groups, through whom they can take the first step towards addressing their needs. A student of OFRI with 100% physical disability is provided with peer support from a colleague from OFRI according to the student's needs, learning materials are submitted in digital form, the communication with parents was established, etc. There is also a possibility for students to study under the conditions for part-time students, if necessary.

The activities of the SSC are funded through applications to various tenders at local, regional, national and international levels, as well as to the tenders of economic operators. Once a year, SuRi rewards the most successful student with a disability, which envisages a one-time cash prize to the amount of HRK 1,000.00. There is also a competition at SuRi

for the Award of scholarships and financial aid from the Aleksandar Abramov Fund intended for full-time and part-time students of SuRi of lower socio-economic status.

**Recommendations for improvement:** None

**Quality grade:** High level of quality

### **3.6. The higher education institution allows students to gain international experience.**

#### **Analysis**

Students are regularly informed about the opportunities for completing part of their study abroad through website, e-mail, etc. During the application and implementation of the exchange program, OFRI provides support to interested students through the function of an Erasmus coordinator. Upon return, the acquired ECTS and grades are entered into the system.

OFRI does not collect data on student satisfaction, but the SuRi Office for International Cooperation keeps records of all incoming and outgoing Erasmus students and keeps statistics by country, component and other such data. After the mobility students fill in the reports and the survey. Students are generally satisfied with the mobility as well as knowledge and experience gained.

Students on OFRI study programmes acquire necessary competencies to work in an international environment. For example, they attend the Seminar in Physics on English language course and some of the students actively participate in international collaborations and spend part of their time experimenting abroad.

**Recommendations for improvement:** None

**Quality grade:** High level of quality

### **3.7. The higher education institution ensures adequate study conditions for foreign students.**

#### **Analysis**

Information on the opportunities for enrolment and study is available to foreign students in the English language at the OFRI website.

SuRi provides support to international students through the Office for International Cooperation and with the organisation of a Welcome Day at the beginning of each semester, while the coordination of LA and the provision of necessary information at OFRI

is carried out by the ERASMUS coordinator in cooperation with the ECTS coordinator and study director.

All incoming students complete final reports after mobility. It is possible to follow OFRI graduate studies classes in English, as well as doctoral study.

All Erasmus students have the right to attend Croatian language courses at the Rijeka School of Croatian Studies at the Faculty of Philosophy.

**Recommendations for improvement:** Encourage and facilitate more incoming mobility.

**Quality grade:** High level of quality

### **3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.**

#### **Analysis**

The criteria and methods for evaluation and grading are clear and published on an official OFRI website before the beginning of a course.

The criteria and methods for evaluation and grading are aligned with the teaching methods used. According to the survey from 2017/2018 OFRI students are satisfied with exams, grading and continuous monitoring of work.

One third of the professors at OFRI are pedagogically-psychologically, didactically and methodically trained for teaching. In the past five years SuRi has organised e-learning courses, a programme for developing professor competencies in higher education, and webinars and a workshop (2020) for the application of a hybrid-teaching model that included the topic of Exams and online colloquia. Professors also participate in educational conferences, scientific colloquia, symposia, professional meetings, etc.

Student satisfaction with exams, grading and continuous monitoring of work was assessed with a high grade (survey 2017/2018).

The OFRI Quality Committee carries out evaluation of grading through student surveys and based on the results propose necessary measures. SuRi also examines student satisfaction with exams, grading and continuous monitoring of work.

According to the Protocol for the Care and Monitoring of Students with Health Disabilities, the Office for Students with Disabilities forms a recommendation on the adjustment of teaching while ensuring the achievement of intended learning outcomes.

Professors communicate exam results to students and give them insight into any form of performance monitoring and provide them with feedback within seven days after the exam.

**Recommendations for improvement:** Continue with professional education of professors

**Quality grade:** High level of quality

### **3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.**

#### **Analysis**

Upon completion of their studies, students are issued a diploma in Croatian and a supplementary document of study in Croatian and English free of charge. But it is necessary to pay the amount of HRK 200.00 for the costs of printing of the diploma.

**Recommendations for improvement:** No recommendations

**Quality grade:** High level of quality

### **3.10. The higher education institution is committed to the employability of graduates.**

#### **Analysis**

OFRI students find a job or continue their career through doctoral studies very soon after graduation. According to the survey carried out by the SuRi Quality Committee in 2019, 100% of students find a job within 3 months of graduation.

Admission quotas are aligned with social and labour market needs and available resources. Within the last several years number of students at OFRI has decreased: number of students is under the expected quotas. Partial cause of this are unfavourable economic conditions. Once a year OFRI analyses enrolment quotas and data on the employability of physics students.

A Career Day took place in 2016, but not many people were interested. Alumni and OFRI staff took part and talked about job opportunities.

The SSC Career Office provides OFRI students and alumni with the opportunity to take part in the Office's educational, advisory, informational and research activities in order to develop career management skills and employability and competitiveness in the labour market.

The OFRI Alumni Club was founded in 2018 and former students contact with professors and occasionally receive e-mails. Information about some former students can be found on OFRI website (main info, where are they now and what are they working on).

**Recommendations for improvement:**

We recognize the efforts made by OFRI in outreach activities to promote physics in the wider community, and strongly recommend the continuation of those activities. Inform



future students more on employability and opportunities after the degree in Physics. Improve the work of Alumni Club and contact with former students, include them more in OFRI's work. Include alumni formally in the teaching quality assurance process.

**Quality grade:** Satisfactory level of quality

## IV. Teaching and institutional capacities

### 4.1. The higher education institution ensures adequate teaching capacities.

#### Analysis

Classes in most courses of the OFRI teaching programmes are taught by the Department staff, but teaching staff of other departments at SuRi participate in OFRI study programmes, for example, courses in the field of mathematics and informatics, which are an integral part of the study programmes of the undergraduate study of Physics and graduate studies of Physics and Mathematics and Physics and Informatics, are held by teaching staff from the Department of Mathematics and the Department of Informatics. Furthermore, the graduate study of Engineering and Physics of Materials is a joint study programme by OFRI and the Faculty of Engineering. After taking all of this into account, it is clear that coverage of each study programme with own staff is within the requirements. The ratio of students and full-time teachers at OFRI is such that it ensures a very high quality of study. But there is a significant difference between the ratio of the number of students and professors on OFRI study programmes and the teaching that OFRI staff conducts at other SuRi constituents.

The main issue in this category is the heavy teaching workload. It is mostly in line with relevant legislation and policies, regulations of competent bodies and collective agreements, but in some cases, it is above the norm. Although the effort of the management of OFRI to distribute the teaching work load between the teachers is evident, it is not completely clear whether it distributed in the fairest way. And, the impression of this Panel is that this heavy teaching workload can have negative effect on staffs' scientific activities. Finally, from the self-evaluation documents, it is evident that the teachers are qualified for the courses they deliver.

#### Recommendations for improvement

The main recommendation in this area would be to lower the teaching workload, but it is not so easy to fulfil it. Teaching workload which would be completely in line with relevant legislation and policies, regulations of competent bodies and collective agreements in Croatia, would still be high enough to have negative effect on scientific work. Furthermore, the most obvious way to lower the teaching workload would be to

hire more staff, but the ability to do so, is also quite limited by the laws and regulations in Croatia. So far, OFRI has used national returnee scheme to increase staff numbers and expertise, and this Panel strongly recommends the continuation of this practice in the future.

**Quality grade** Satisfactory level of quality

#### **4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures which include the evaluation of excellence.**

##### **Analysis**

The employment of teaching staff is carried out in accordance with legal regulations, and the offer of vacant positions and appointments are conducted in accordance with the OFRI Strategy. When selecting candidates, criteria of excellence are taken into account, and special attention is paid to the candidate's track record in scientific and teaching work. One of the obligatory attachments required is a certificate of positively assessed student evaluation of the teacher's work. OFRI does not have specially prescribed competitive criteria for selecting excellent candidates, and excellence is assessed on a case-by-case basis. Promotion of teachers into higher grades is in line with prescribed national minimum conditions, and there is a proscribed formal procedure, which takes into account candidate's important achievements.

##### **Recommendations for improvement**

To ensure high level of excellence of future staff, OFRI could consider proscribing additional competitive criteria in addition to the prescribed national minimum conditions. Also, to encourage project activities, they could put more emphasis on candidate's successful projects in promotion procedure.

**Quality grade** High level of quality

#### **4.3. The higher education institution provides support to teachers in their professional development.**

##### **Analysis**

OFRI Teachers have an opportunity to attend a lifelong learning program "Teacher Competencies in Higher Education: Learning and Teaching", at SuRi's Faculty of Philosophy, which enables university teachers to acquire the basic knowledge and skills needed for higher education. Also, one of the activities within this program is teaching in the presence of teaching staff from other SuRi constituents and reviewing peer criticism. Furthermore, OFRI carries out anonymous student surveys for each

course. The results of these surveys are available to the teaching staff to whom the surveys relate.

OFRI Teachers are offered mobility opportunities through national and international scientific projects, and through projects aimed at mobility and networking, e.g. Erasmus, COST, bilateral projects. Level of scientific and professional mobility of the staff is quite good, but the level of teaching mobility is quite low. So far there have been no requests for a sabbatical year. Due to the significant teaching workload, teachers find it difficult to decide on a free study year.

#### Recommendations for improvement

In the new strategy, OFRI management should envision additional measures to encourage and facilitate sabbaticals and other mobility opportunities. This problem is closely related to high teaching workload, so our recommendations for 4.1, also apply here.

**Quality grade** Satisfactory level of quality

**4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.**

#### Analysis

The development of OFRI infrastructure is largely related to the development of the SuRi infrastructure, and OFRI Development strategy (2018-2020) has closely followed development strategy and strategic goals of SuRi. The new SuRi strategy (for 2021-2025) has been accepted very recently (during this reaccreditation procedure), and now the imperative of OFRI is to adopt a new development strategy for the same period.

OFRI lecture halls cover approximately 400 m<sup>2</sup>. In addition to this, teaching also takes place in practicums, teaching laboratories and the IT classroom. Furthermore, equipment used in scientific research is also available to students, which includes OFRI's scientific laboratories, and the Bura supercomputer. Teaching staff have 31 offices with a total area of over 500 m<sup>2</sup> at their disposal, so there is plenty of available office space for more employees. Experimental scientific work is carried out in nine OFRI laboratories, and five of them have been established in the last 5 years, therefore the laboratory equipment is very up to date.

#### Recommendations for improvement

One of the major advantages of OFRI are modern facilities and research equipment with plenty of space for expansion. But in time, that equipment will age, and therefore we

recommend that the new OFRI development strategy (for 2021-2025) should include plans for acquiring major new infrastructure, maintaining the existing infrastructure and achieving critical mass in more research activities. Also, some of the equipment in practicums seems outdated, and should be replaced/updated.

**Quality grade** High level of quality

**4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.**

#### **Analysis**

The library available for students, teachers and non-teaching staff is located in the Campus Branch of the University Department building. The library allows online research and submission of inquiry for material issuing, and sufficient number of required literature titles is available to students. The library fund is continuously renewed by purchasing books from the funds of its own projects or donations. The reading room within the Campus Branch contains 44 places equipped with personal computers with internet access.

Research and scientific papers in the field of science dealt with by OFRI scientific staff are mainly published in e-journals available through databases procured at the level of the Republic of Croatia. The Campus branch has access to databases with full years of journals that are procured annually for the Republic of Croatia, and which provide members with access to electronic journals with full text.

#### **Recommendations for improvement**

No recommendations

**Quality grade** High level of quality

**4.6. The higher education institution rationally manages its financial resources.**

#### **Analysis**

Management of OFRI has taken various measures to stabilize finances, and eliminate debt from previous years. They have reduced surface space, by leaving unused space to other SuRi constituents, and by establishing joint laboratories with NANORI. They have encouraged project activities, which is essential for maintenance of scientific equipment and acquiring consumables. Additional funds were obtained through external projects with a local municipality and a public company. The number of external associates to

whom OFRI paid classes per hour was reduced, by taking over part of the teaching activities by teaching staff from the Department. Also, publication of papers in top journals is encouraged at SuRi through variable part of funding from Programme Agreements, and due to the staff's scientific output, OFRI receives significant funds through this channel. Number of physics students is decreasing at undergraduate and graduate level, which has negative effect on the finances, because of the lower income from tuition fees, but newly established Doctoral Study of Physics generated some increase in this type of income.

Every year, the Management Board submits annual financial reports to the OFRI Council with detailed explanations of revenues and expenditures on all points of the report. Each employee is familiar with the available resources as needed or on request, and all major financial decisions are approved at Council sessions or in agreement with project managers. Also, from the self-evaluation documents it is evident that additional sources of funding are used to develop and improve the higher education institution.

OFRI also generates funds through national and international projects, through collaboration with the industry sector and the local community, but at this time, there is only one scientific project active funded by Croatian Science Foundation, and one project funded by European Social Fund.

### Recommendations for improvement

To ensure long-term financial sustainability, project activity should be increased, so that the existing scientific equipment could be properly maintained, and upgraded when needed. Also, we recommend continuation of collaboration with the industry sector and the local community, and further acceleration in that aspect. The decrease in the number of physics students is not just a problem of financial sustainability but a wider issue, and it is not specific only to OFRI, but we recognize the efforts made by OFRI in outreach activities to promote physics in the wider community, and strongly recommend the continuation of those activities (as described elsewhere).

**Quality grade** Satisfactory level of quality

## V. Scientific/artistic activity

### **5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.**

#### Analysis

The Department has maintained a robust and high-quality scientific output. OFRI personnel has published 175 scientific articles with a vast majority (86%) in

internationally recognized journals during the last five years. The high quality of the publications is reflected by the fact that one half of them reach the first quartile (Q1 category) or better according to the journal classification scheme. The average citation per article during the last five years is >10 which can be considered as a very good scientific impact (in total 7295 citations, h-index 40). The division of articles across different groups inside OFRI shows a very good balance where all groups are performing, and the annual average number of publications per employee (1.67) can be considered good given the heavy teaching load that the staff is facing. The demonstrated scientific output of OFRI is far above the SuRi average. OFRI actively rewards the groups and individual staff members for their scientific merits by providing result-based research funding and individual awards annually. The quality and number of publications contributes consistently towards promotion to higher scientific and scientific teaching titles. OFRI staff publish in journals that are included in the most common international scientific databases, and they regularly update their publications in the local CROSB database and individual portfolios.

The personnel have presented their results 80 times (20 national / 60 international) in scientific and professional conferences (15 invited lectures) and they have organized three scientific conferences during the last five years. The average annual number of conference presentations is small, less than 1 per staff member.

The OFRI PhD program is very recent and has not resulted in completed PhD works yet, while two OFRI employees have received PhD degrees from other universities during the five-year period. The interviewed PhD students turned out very motivated and satisfied with their research work and conditions, which gives a very good impression of the running PhD program.

### Recommendations for improvement

The Department should develop a strategy for scientific quality-assurance upon promotion procedures that would complement the superficial counting of the number of publications and journal impact factors (quantity-based evaluation, national procedure). The Department should enforce an open-access (OA) policy for its publications by setting a rule that OA versions (or links to such version) must be included in the CROSB database. Many of the listed publications in CROSB already have this option included, but not all.

The department should consider strategies for increasing participation (and visibility) in international scientific workshops and conferences such that each staff member would present their results at least once per year.

**Quality grade** High level of quality

## **5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.**

### **Analysis**

OFRI has had a development strategy since 2018 to promote public activity and co-operation with the business sector and local community. The Department also monitors the changing needs of the society and takes these into account while carrying out harmonisation in its study programmes. The great challenge is the need for educating more students in physics, teaching and engineering. Correspondingly, OFRI supports research in educational physics in order to facilitate a change in teaching and learning physics and to alleviate the national teacher shortage. Concerning social relevance, OFRI contributes in the fields of nanotechnology and sustainable development (areas of smart specialization) in its laboratories and NANORI.

OFRI staff has applied successfully for the internal research funding at SuRi and have currently eight projects running (UNIRI, UNIRI plus). The Department has developed significantly its knowledge and technology transfer processes, and it has currently an affiliated employee. OFRI receives further support from the SuRi technology transfer office and Step Ri (technology park). Successful implementation of these measures is demonstrated as a submitted patent application (Dec. 2020). Furthermore, OFRI performs research for local clients which generates further revenue that can be used for funding research activities.

### **Recommendations for improvement**

The Department could monitor its activities in sustainable development and draft a strategy for dissemination and further endorsement of projects in this field. The corresponding research activities could be reported in public outreach actions demonstrating OFRI's commitment in solving societally crucial problems.

**Quality grade** High level of quality

## **5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.**

### **Analysis**

The Department's project portfolio is good but there are also places for improvement. One member of the staff has received an international award while several members have been granted SuRi internal awards for teaching and scientific output. The employees regularly apply for national and European funding calls, and currently OFRI holds 2 scientific and 6 professional projects. In addition, the Department is very active in applying in SuRi tenders and it has had 21 internal projects during the last 5 years.

All employees (technicians not included) participate in at least one project, and the obtained project funding covers 11% of the total revenue. The activity in applying EU funding (ERC, Horizon Europe) has been low, and discussions with some staff members revealed problems with motivation and lack of confidence.

The staff members have been invited 15 times as visiting lecturers nationally and internationally. The topics have covered a broad range of physics demonstrating a good balance across the groups. The OFRI personnel are active in participating conference organization (22 conferences in the past 5 years) and 2 members participate in the editorial boards of scientific journals (SCImago Journal Ranking Database: Q3 and Q4). The OFRI professors and associates are not participating in evaluation panels for European funding.

### Recommendations for improvement

The Department should improve its measures for motivating and supporting its staff members in participating EU calls.

The staff members should actively engage in evaluation panels of international funding offices, starting from those of the European Union. The gained insight, knowledge and networks can help in making improved proposals.

The personnel should aim for increased presence in editorial boards, especially in higher-impact journals in quartiles Q1 and Q2.

**Quality grade** Satisfactory level of quality

## **5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.**

### Analysis

OFRI has a clear development strategy since 2018 which is in line with the vision of the Department and with the basic guidelines of SuRi. The corresponding objectives are formulated in annual action plans, and the implementation of the strategy is monitored based on well-established procedures on an annual basis.

The strategy for the scientific activity includes six targeted goals with activities and indicators elaborated in detail. The most crucial of these include research groups (Goal 1.1) and infrastructure (Goal 1.3). The former addresses creation and strengthening of priority fields of research in four areas: experimental solid-state physics, astroparticle physics, elementary particle physics and educational physics. While most groups have achieved the “critical mass”, discussions with the staff members and PhD students reveal that there are still some fields which rely on one professor who is in charge of both teaching the subject and supervising students.



The experimental infrastructure at OFRI (six joint laboratories with NANORI, state-of-the-art equipment) is very good, and there is a strategy for its strengthening and modernization. Until now, the maintenance and running costs of the equipment have been successfully secured by laboratory directors through projects and analytical services for external clients. However, such strong dependence on external funding cannot be considered as a sustainable financial model. The OFRI computing infrastructure is satisfactory but needs modernization. The Bura supercomputer (installed 2016, upgrade 2020) is a great resource for computational research activities. The OFRI strategy includes a goal for employment and advancement of highest calibre scientists (Goal 1.5). During 2016-2020, 10 new jobs have been created and 10 more positions have been promoted. The Department has been very successful in using the national returnee scheme in building up staff numbers. The number of international employees is very low (2) and there are no international postdoctoral fellows. The gender distribution amongst the staff members is even.

The Department has built research connections with the local society. The collaboration with the business sector (Goal 1.6) includes analytical services for the local industry and municipalities, and as stated above, this function is important for the laboratory budgets.

#### Recommendations for improvement

A new strategy should include plans for acquiring major new infrastructure, maintaining the existing infrastructure and achieving critical mass in more research activities (especially to help in mentoring PhD students).

The Department should pay particular attention to its computational infrastructure (workstations) and its modernization. Further, a contingency plan should be drafted for the maintenance/replacement of the Bura supercomputer as its hardware (2016) becomes gradually obsolete.

The Department should increase its industrial collaboration, and especially on a larger geographical radius. The strategy document should be revisited correspondingly.

The Department should encourage and support its members (a) to apply for individual ERC grants from the European Union (funding for PhD students, postdocs, infrastructure), and (b) apply as a host for the MSCA postdoctoral program in order to attract international fellows (See also 5.3).

**Quality grade** Satisfactory level of quality

### **5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.**

#### Analysis

OFRI uses its research infrastructure efficiently. In addition to scientific activities, the laboratories are used for teaching and preparation of graduate theses. During the last 5 years, one half of the MSc works (27) have been carried out in the OFRI laboratories under staff supervision. Part of the teaching in individual courses is performed in these laboratories. Similarly, part of the PhD courses uses the OFRI laboratories, while the PhD students carry out their research employing the infrastructure. Graduate and postgraduate students take part in the research activities which has been demonstrated as involvement in scientific (11) and professional (3) articles. On the other hand, interviews revealed that there has been very little student involvement (including PhD students) in the co-operation with the business sector and local communities. The staff members take actively part in the postgraduate / PhD student supervision in the fields of their expertise. There is less staff available in some fields of physics, which makes the PhD students more dependent on a single professor.

### **Recommendations for improvement**

OFRI should consider increased student involvement in external projects in order to foster networking and recruitment opportunities for students / young researchers, as described elsewhere.

The strategy should include action plans for ensuring two qualified supervisors (supervisor, co-supervisor) for each PhD student from their field of study.

**Quality grade** Satisfactory level of quality

## APPENDICES

### 1. Quality assessment summary - tables

<i>Quality grade by assessment area</i>				
<i>Assessment area</i>	Unsatisfactory level of quality	Minimum level of quality	Satisfactory level of quality	High level of quality
<i>I. Internal quality assurance and the social role of the higher education institution</i>				X
<i>II. Study programmes</i>				X
<i>III. Teaching process and student support</i>				X
<i>IV. Teaching and institutional capacities</i>				X
<i>V. Scientific/artistic activity</i>			X	

<i>Quality grade by standard</i>				
<i>I. Internal quality assurance and the social role of the higher education institution</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
1.1. The higher education institution has established a functional internal quality assurance system.				X
1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.			X	
1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.				X
1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).			X	
1.5. The higher education institution understands and encourages the development of its social role.				X
1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.			X	

<i>Quality grade by standard</i>				
<i>II. Study programmes</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.				X
2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.			X	
2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.				X
2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.				X
2.5. The higher education institution ensures that ECTS allocation is adequate.				X
2.6. Student practice is an integral part of study programmes (where applicable).			X	

### *Quality grade by standard*

<i>III. Teaching process and student support</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.			X	
3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.			X	
3.3. The higher education institution ensures student-centred learning.				X
3.4. The higher education institution ensures adequate student support.			X	
3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.				X
3.6. The higher education institution allows students to gain international experience.				X
3.7. The higher education institution ensures adequate study conditions for foreign students.				X
3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.				X
3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.				X
3.10. The higher education institution is committed to the employability of graduates.			X	

<i>Quality grade by standard</i>				
<i>IV. Teaching and institutional capacities</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
4.1. The higher education institution ensures adequate teaching capacities.			X	
4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures which include the evaluation of excellence.				X
4.3. The higher education institution provides support to teachers in their professional development.			X	
4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.				X
4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.				X
4.6. The higher education institution rationally manages its financial resources.			X	

### *Quality grade by standard*

<i>V. Scientific/artistic activity</i>	<i>Unsatisfactory level of quality</i>	<i>Minimum level of quality</i>	<i>Satisfactory level of quality</i>	<i>High level of quality</i>
5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.				<b>X</b>
5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.				<b>X</b>
5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.			<b>X</b>	
5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.			<b>X</b>	
5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.			<b>X</b>	



## 2. Site visit protocol

### Edukacija članova stručnog povjerenstva u virtualnom okruženju/ Training of the Expert Panel

	<b>srijeda 31. ožujka 2021.</b>	<b>Wednesday, 31<sup>th</sup> March 2021.</b>
<b>9:25 – 9:30</b>	Spajanje na poveznicu ZOOM	Joining the ZOOM meeting via link
<b>9:30 –</b>	Edukacija članova Stručnog povjerenstva <ul style="list-style-type: none"> <li>• Predstavljanje AZVO-a</li> <li>• Predstavljanje sustava visokog obrazovanja u RH</li> <li>• Postupak reakreditacije</li> <li>• Standardi za vrednovanje kvalitete</li> </ul> Interni sastanak Stručnog povjerenstva – priprema za posjet <ul style="list-style-type: none"> <li>• Kako napisati Završno izvješće</li> <li>• Priprema povjerenstva za posjet visokom učilištu (rasprava o Samoanalizi i popratnim dokumentima)</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation of ASHE</li> <li>• Overview of the higher education system in Croatia</li> <li>• Re-accreditation procedure</li> <li>• Standards for the evaluation of quality</li> <li>• How to write the Final report?</li> <li>• Discussion on the Self-evaluation report and supporting documents</li> <li>• Discussion on pre-prepared questions</li> </ul> Appointment of Expert Panel Chair

### Virtualni sastanak članova stručnog povjerenstva, diskusija o zapažanjima i impresijama nakon analize dokumenata i priprema za posjet /Virtual meeting of Expert Panel members, discussion on observations and impressions from the document analysis and preparation for site visit

	<b>srijeda, 14. travnja 2021.</b>	<b>Wednesday, 14th April 2021,</b>
8:55 –9:00	Spajanje na poveznicu (link) ZOOM recenzenata	Joining the ZOOM meeting via the link with panel members
9:00 –	Interni sastanak Stručnog povjerenstva	Internal meeting of the Expert panel

**Joint online meetings to the University of Rijeka, Departments of Mathematics, Physics  
and Informatics**

**Preliminarni posjet Stručnog povjerenstva u virtualnom okruženju**

	<b>ponedjeljak 19.travnja 2021.</b>	<b>Monday, 19<sup>th</sup> April 2021.</b>
<b>8:50 - 9:00</b>	Spajanje na poveznicu ZOOM i kratki interni sastanak stručnog povjerenstva	Joining the part of the Expert Panel members to the ZOOM meeting via link
<b>9:00 - 10:15</b>	Sastanak sa Upravom Odjela (rektorica, pročelnici)	Meeting with the University Management and Department Management
<b>10:15 - 10:30</b>	<i>Pauza</i>	Break
<b>10:30 - 11:30</b>	Sastanak s predstavnikom Ureda za međunarodnu suradnju i Ureda za projekte	Meeting with representatives of Office for International affairs and Office for Projects

**Prvi dan reakreditacije u virtualnom okruženju / First day of online re-accreditation**

	<b>utorak, 20. travnja 2021.</b>	<b>Tuesday, 20<sup>th</sup> April 2021.</b>
<b>9:20 – 9:50</b>	Spajanje na poveznicu ZOOM i kratki interni sastanak stručnog povjerenstva	Joining the part of the Expert Panel members to the ZOOM meeting via link and short meeting of the Panel members
<b>9:50 – 10:00</b>	Spajanje visokog učilišta na poveznicu ZOOM	Joining the part of Department to the ZOOM meeting via link
<b>10:00 - 10:30</b>	Sastanak s pročelnikom i zamjenicom pročelnika	Meeting with the Department Management
<b>10:30 – 10:35</b>	<i>Pauza</i>	Break
<b>10:35 – 11:35</b>	Sastanak s Odborom za kvalitetu i timom za samoanalizu	Meeting with Quality Assurance Committee and Team for Selfevaluation
<b>11:35 – 11:45</b>	<i>Pauza</i>	Break
<b>11:45 – 12:45</b>	Sastanak sa studentima svih studijskih programa - otvoreno za sve studente	Meeting with students
<b>12:45 – 13:45</b>	<i>Pauza za ručak</i>	Lunch Break
<b>13:45– 14:45</b>	Sastanak s nastavnicima, u stalnom i kumulativnom radnom odnosu, osim onih na rukovodećim mjestima	Meeting with full-time employed teachers (except those in managerial positions)
<b>14:45 – 15:00</b>	<i>Pauza</i>	Break
<b>15:00 – 15:25</b>	Sastanak s alumnijima (bivši studenti koji nisu zaposlenici visokog učilišta)	Meeting with Alumni (former students who are not employed by the Department/Higher education institution)
<b>15:25 – 15:30</b>	<i>Pauza</i>	Break
<b>15:30 – 15:55</b>	Sastanak s vanjskim dionicima - predstavnicima strukovnih i profesionalnih udruženja, poslovna zajednica, poslodavci, stručnjaci iz prakse, organizacijama civilnog društva, vanjski predavači	Meeting with external stakeholders - representatives of professional organisations, professional experts, external lecturers, non-governmental organisations...
<b>16:00 - ...</b>	<i>Interni sastanak članova stručnog povjerenstva – osvrt na prvi dan i priprema za drugi dan</i>	<i>Internal meeting of the Expert Panel members</i>

**Drugi dan reakreditacije u virtualnom okruženju / Second day of online re-accreditation**

	<b>srijeda, 21. travnja 2021.</b>	<b>Wednesday, 21<sup>th</sup> April 2021.</b>
<b>9:00 – 9:20</b>	Spajanje na poveznicu ZOOM i kratki interni sastanak stručnog povjerenstva	Joining the part of the Expert Panel members to the ZOOM meeting via link and short meeting of the Panel members
<b>9:20 – 9:30</b>	Spajanje visokog učilišta na poveznicu ZOOM	Joining the part of Department to the ZOOM meeting via link
<b>9:30 – 10:30</b>	Sastanak s voditeljima zavoda i/ili studijskih programa	Meeting with the heads of divisions and/or heads of study programmes
<b>10:30 – 10:35</b>	<i>Pauza</i>	Break
<b>10:35 – 11:35</b>	Sastanak s voditeljima znanstvenih i stručnih projekata	Meeting with the Heads of research projects
<b>11:35 – 11:45</b>	<i>Pauza</i>	Break
<b>11:45 – 12:45</b>	Sastanak s asistentima i doktorandima	Meeting with Teaching Assistants and postdoctoral researchers
<b>12:45 – 13:00</b>	<i>Pauza</i>	Break
<b>13:00 – 13:30</b>	Sastanak sa službama na odjelu: <ul style="list-style-type: none"> <li>• ERASMUS koordinatorom</li> <li>• ECTS koordinatorom.</li> </ul>	Meeting with: ERASMUS coordinator ECTS coordinator
<b>13:30 – 14:30</b>	<i>Pauza za ručak</i>	Lunch Break
<b>14:30 – 15:15</b>	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions – if needed
<b>15:15 - ...</b>	<i>Interni sastanak članova stručnog povjerenstva – osvrt na drugi dan i priprema za treći dan</i>	<i>Internal meeting of the Expert Panel members</i>

**Treći dan reakreditacije u virtualnom okruženju/ Third day of online re-accreditation**

	<b>četvrtak, 22. travnja 2021.</b>	<b>Thursday, 22<sup>th</sup> April 2021</b>
<b>9:30 - 11:00</b>	Spajanje na poveznicu ZOOM i interni sastanak stručnog povjerenstva	Joining the part of the Expert Panel members to the ZOOM meeting via link and short meeting of the Panel members
<b>11:00 - 11:15</b>	Spajanje visokog učilišta na poveznicu ZOOM	Joining the part of Department to the ZOOM meeting via link
<b>11:15- 11:30</b>	Završni sastanak sa Upravom visokog učilišta (pročelnikom i zamjenicom pročelnika)	Exit meeting with the Department Management
<b>11:30 -</b>	<i>Sastanak članova stručnog povjerenstva – ocjenjivanje prema standardima kvalitete</i>	<i>Internal meeting of the Expert panel members – assessment according to quality standards</i>

## SUMMARY

The Department of Physics of the University of Rijeka has approximately 20 academic staff and 150 students. It offers an undergraduate physics programme, four graduate programmes including two with specialisation in teaching (reflecting the Department's origins in teacher training programmes within the Faculty of Philosophy) and a new postgraduate programme. The research is organised into the Division of Theoretical Physics and Astrophysics, and the Division of Experimental and Applied Physics. The Department develops its policies and strategies with reference to those from the University, and national and international agencies.

The Department is subject to significant external constraints, including national policies on academic hiring, promotion and salaries. There is also an issue with the perception of physics within wider society: under-appreciation of the utility of physics to both personal and national development is leading to a squeeze in resources and a low level of interest in studying physics. This leads to a vicious circle, with an insufficient supply of qualified physics teachers in elementary and high school resulting in further decreasing popularity of the subject amongst potential undergraduates.

The panel reviewed the self-evaluation paperwork provided and interviewed management, staff, students and other stakeholders. Overall, the panel were impressed with the performance of the Department, with all points being judged to be at least at a satisfactory level, and 4/5 assessment areas judged to be at a high level of quality.

The panel were particular impressed by the ways in which the Department are overcoming the external constraints (such as using the national returnee scheme to increase staff numbers) or even actively trying to change them (such as the large variety of outreach activities). The panel considered the teaching environment to be of very high standard, with an excellent relationship between staff and students, and very effective feedback and improvement mechanisms. In addition, the panel were impressed by the successful introduction of the new Physics PhD programme – only the second nationally. The panel identified several areas for improvement, including enhancing staff mobility, encouraging (and enabling) applications to international funding agencies, and establishing an effective system of staff review to help career development. The Department is encouraged to keep using existing channels (programme review, national returner scheme etc.) to reduce the heavy teaching load on research-active staff.