Habilitation Board Decision on the Nomination for Appointment to Associate Professor

Masaryk University	
Faculty	Faculty of Science
Procedure field	Physics of Plasma
Applicant	Mgr. Jaroslav Hnilica, Ph.D.
Applicant's home unit, institution	Faculty of Science, Masaryk University
Habilitation thesis	Diagnostics of High Power Impulse Magnetron Sputtering Discharge
Board members	
Chair	prof. RNDr. Mirko Černák, CSc. *Faculty of Science, Masaryk University*
Members	doc. Mgr. Tomáš Hoder, Ph.D. *Faculty of Science, Masaryk University* doc. Ing. Petr Zeman, Ph.D. *Department of Physics, Faculty of Applied Sciences, University of West Bohemia* doc. RNDr. Ondřej Kylián, Ph.D. *Department of Macromolecular Physics, Faculty of Mathematics and Physics, Charles University* Assoc. Prof. Daniel Lundin, Ph.D. *Department of Physics, Chemistry and Biology, Linköping University, Sweden*

Evaluation of the applicant's scholarly/artistic qualifications

The applicant, Jaroslav Hnilica, received his Ph.D. degree in the field of Plasma Physics at the Faculty of Science, Masaryk University, Czech Republic. After his Ph.D., he continued his scientific work as a research and development scientist at the Department of Physical Electronics (now the Department of Plasma Physics and Technology), Faculty of Science, Masaryk University. At the beginning of his scientific career, he very actively sought international cooperation in the form of short, dedicated internships at prestigious workplaces in the West, where he gained valuable experience. Between 2013 and 2019, he spent four months at three international universities and institutes, namely Leibniz Institute for Plasma Science and Technology (INP), Greifswald, Germany; Laboratory of Physics of Gases and Plasmas (LPGP), University Paris Saclay, France; Chimie des Interactions Plasma-Surface (ChIPS), University of Mons, Belgium. Subsequently, he established cooperation with the industrial sector in a similar way. He spent three months between 2015 and 2023 working on collaborating projects in private companies SHM s.r.o. and PLATIT a.s. His research is currently focused on plasma diagnostics of sputtering discharges, instabilities in magnetron discharge, and the development and improvement of the deposition processes.

The habilitation application is based on 38 articles (with significant publication in WOS Q1 and Q2), 14 proceeding papers, and one software. The work is highly cited, represented by 335 citations (without self-citation) and H-index 15. The originality of the achieved results of his scientific work and the real possibilities of their practical applications in the field of physics is evidenced by the fact that he is the co-holder of two verified technologies, two utility models, and one functional sample. In the field of plasma physics, Jaroslav Hnilica cooperates intensively with foreign workplaces. This is reflected in the fact that more than 30 percent of his articles are made with co-authors from abroad.

In the last 10 years, Dr. Hnilica has participated in the implementation of a number of basic and applied research projects. Specifically, there were two applied research projects that he led as principal investigator and three others in which he was a member of the research team. As a member of the research team, he also participated in the implementation of 2 basic research projects. Dr. Hnilica was also a member of the research teams of projects funded by the Ministry of Education and Science, whose aim was to build and further develop the CEPLANT research centre.

Conclusion: The applicant's scholarly/artistic capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Physics of Plasma.

Evaluation of the applicant's pedagogical experience

Jaroslav Hnilica started his teaching activities as a Ph.D. student, participating in courses such as Electricity and magnetism and Introduction to Microphysics. Consecutively, his involvement in pedagogical activities increased. Currently, he is involved in classes at the bachelor level (Physical laboratory 3, Introduction to Microphysics), master level (Diagnostics methods 1), and doctoral level (Plasma Diagnostics and Simulations).

He has supervised four successfully defended bachelor's, two master's, and one doctoral thesis. It is worth mentioning that in 2022, he, as a supervisor, received a vice-rector's award for excellence in doctoral studies together with his Ph.D. student Mgr. Marta Šlapanská, Ph.D.

Dr. Hnilica showed his pedagogical skills during his public lecture, receiving highly positive evaluations from both the habilitation board members and the audience.

Conclusion: The applicant's pedagogical capabilities **meet** the requirements expected of applicants participating in a habilitation appointment procedure in the field of Physics of Plasma.

Habilitation thesis evaluation

The habilitation thesis is of a very good standard. It was reviewed by three external opponents: doc. RNDr. Vítězslav Straňák, Ph.D. (Faculty of Science, University of South Bohemia, Ceske Budejovice), doc. Ing. Tomáš Kozák, Ph.D. (University of West Bohemia, Department of Physics, Plzen) and prof. RNDr. Milan Tichý, DrSc. (Faculty of Mathematics and Physics, Charles University, Prague).

The assessment of all reviewers evaluated this habilitation thesis very positively. They also mention its high professional, graphic, and formal level. Reviewers also emphasize many fruitful collaborations with leading scientists in the field. They also mentioned that the text of the introductory chapters documents the author's didactic experiences.

All reviewers acknowledged the applicant's high level of scientific competence and research skills, noting their long-term and systematic contributions to the field of plasma physics. They also recognized the applicant's inventive capabilities and methodological expertise.

The reviewers had 14 questions for the applicant. Therefore, the responses were provided in the form of a presentation distributed to both the committee members and all reviewers. According to the reviewers, the applicant adequately addressed and satisfactorily answered all queries. Furthermore, they acknowledged the applicant's good insight into the topics. Even in cases where a definite answer is not known, the applicant offered reasonable explanations. Additionally, during the public lecture, the applicant directly addressed the four extended questions raised by the reviewers.

Conclusion: The applicant's habilitation thesis **meets** the requirements expected of habilitation theses in the field of Physics of Plasma.

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Secret vote results

Voting took place: electronically

Number of board members		5
Number of votes cast		5
of which	in favour	5
	against	0

Board decision

Based on the outcome of the secret vote and following an evaluation of the applicant's scholarly or artistic qualifications, pedagogical experience and habilitation thesis, the board hereby submits a proposal to the Scientific Board of the Faculty of Science of Masaryk University to **appoint the applicant associate professor** of Physics of Plasma.

In Brno on 20.11.2023

prof. RNDr. Mirko Černák, CSc. .....