Evaluation Board Decision on the Nomination for Appointment to Professor

Masaryk University	
Faculty	Faculty of Science
Procedure field	Physics of Plasma
Applicant	doc. Mgr. Tomáš Hoder, Ph.D.
Applicant's home unit, institution	Faculty of Science, Masaryk University
Board members	
Chair	prof. Mgr. Petr Vašina, Ph.D. *Faculty of Science, Masaryk University*
Members	prof. RNDr. Mirko Černák, CSc. *Faculty of Science, Masaryk University* Prof. Dr. Achim von Keudell *Faculty of Physics and Astronomy, Ruhr University Bochum, Germany* prof. Jan Benedikt, Ph.D. *Christian-Albrechts-Universität zu Kiel Mathematisch-Naturwissenschaftliche Fakultät* Prof. Françoise Massines *CNRS, PROMES, University Perpignan, France*

Evaluation of the applicant's scholarly/artistic qualifications

Tomáš Hoder is a recognized scientist and academic in the field of plasma physics. His expertise is in low temperature plasma physics, particularly of the physics of non-equilibrium cold plasmas generated by transient discharges, their diagnostics supported by numerical modelling.

In 2009 at the Masaryk University (MUNI), he defended his Ph.D. thesis. For his thesis, he cooperated with the University of Greifswald, Germany, and the International Laser Centre in Bratislava, Slovakia. Since 2008, still as a doctoral student, he was staff scientist at the Leibniz Institute for Plasma Science and Technology, INP Greifswald (Germany) where he was active as a postdoc until 2014. He contributed to fundamental research on non-equilibrium plasmas as well as to applied projects in cooperation with industry. During the year 2013, he spent a half-year as a visiting researcher at the Institute of Plasma Physics of the Czech Academy of Sciences (IPP-CAS) in Prague. For this stay, he obtained a grant from the European Science Foundation in cooperation with IAA-CSIC institute in Granada, Spain, contributing to the physics of atmospheric electricity. In 2014, he returned to Masaryk University, where he obtained his habilitation and was appointed as an associate professor in 2020. He led several research projects contributing to the understanding of barrier and streamer discharges. From 2017 on, he coordinated an informal research group and after the creation of the official group structure at the Department of Plasma Physics and Technology, he became head of the Plasma diagnostics and Modelling group, with 9 members and approximately ten doctoral students.

Tomáš Hoder studies atmospheric pressure electrical discharges. He focuses on sensitive spatiotemporally high-resolved spectroscopy and on the electrical characterization of these plasmas. In the community he is known for his important contributions to the development of spectroscopic methods for the determination of the electric field from optical emission spectra of the investigated plasmas. These methods are used in further studies of industrially applied plasmas, as well as in fundamental research in plasma physics or in geophysics. He is an author of a topical review paper on this topic in the leading journal in the field - Plasma Sources Science and Technology (PSST). He is also an expert on the highly demanding topic of streamer discharges where he co-authored a topical review in the same journal as well. Moreover, the research of his team at MUNI led to a clear understanding of thermal filaments in surface barrier discharge plasmas, a phenomenon occurring in plasmas for combustion, and to the detailed understanding of barrier discharges and their diagnostics using optical emission spectroscopy, with support of numerical modelling.

His expertise allows him to initiate fruitful collaborations in the field with international partners around the world. He is also being invited to contribute to joint projects in the fields of plasma- and geophysics. As a postdoc, he brought together experts on streamer discharge physics and led a joint project resulting in a successful article in cooperation of MUNI, INP Greifswald, IPP-CAS and Ecole Polytechnique Paris. In his career, he cooperated with partners from multiple international institutions, including, apart from the already mentioned ones, also LAPLACE laboratory in Toulouse, where he was two times invited as a visiting professor and co-supervises Ph.D. student there. He initiated and led a cooperation with Ohio State University in the US and brought a state-of-the-art laser diagnostic method back to the laboratories in Brno. He leads a project on surface barrier discharges in cooperation with University of Belgrade, Serbia. At the University in Pau (France), the University of Granada (Spain), the Technical University of Eindhoven (Netherlands) or the University of Bratislava, he was, apart from a fruitful cooperation resulting in joint articles, also committee member in doctoral exams or PhD thesis defences.

Tomáš Hoder contributed to research projects with partners from industry, such as Ozonia, EATON or OZM. For EATON, research of his team led to understanding of the discharges in eco-friendly insulating gases for high-voltage switchgears and the electrical charge interaction with insulating surfaces in these gases.

He was a principal investigator of two Czech Science Foundation (GAČR) projects, one project of the Technology Agency of the Czech Republic and one project of the European Science Foundation. He was a team member of two other GAČR projects and a Research program head of the CEPLANT project from 2015 to 2019. At the project of the Large Research Infrastructures of CEPLANT he is a member of the internal committee.

On 10.1.2025 he is an author of 71 contributions on Web of Science, 60 of them are research papers, with total of 1597 citations (1356 without self-citations) and with h-index of 25.

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

Evaluation of the applicant's pedagogical experience

Tomáš Hoder teaches the lecture Physics of Plasmas 2 for Master students and Basic Quantum Mechanics for students of Physics Education. He introduced a new course of Microphysics Plus on advanced microphysics and leads the exercises of the main course of Introduction to Microphysics. Further pedagogical experiences can be found in the Annexes.

He successfully led 4 Bachelor, 2 Master and 1 PhD student. Currently 1 Master student and 2 PhD students are finishing their thesis under his supervision, too. During his activities at the Leibniz Institute of Plasma Science and Technology in Greifswald, he has advised and trained approximately 10 students in total.

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

Evaluation of the applicant as a respected and recognized scholarly or artistic figure in a given field

Tomáš Hoder co-authored two invited Topical Review articles in the leading journal in his field, he co-authored two book chapters. On 10.1.2025 he is an author of 71 contributions on Web of Science, 60 of them are research papers, with a total of 1597 citations (1356 without self-citations) and with an H-index of 25. From 60 research papers in high impact journals, 33 of them are Q1 journals, mostly in the leading journal in the field - PSST. He gave 15 invited lectures at international conferences and 10 invited lectures at international institutions and seminars. He was invited to conferences in the fields of plasma science, geophysics, redox chemistry or atomic/molecular physics. His contribution to streamer physics earned him an invited talk in 2015 at the International Conference on Phenomena in Ionized Gases and 2021 at the Gaseous Electronic Conference, two respected meetings in the field. He was invited to speak at universities in Bochum, Toulouse or Greifswald. He is a member of the International Scientific Committees of two international conferences: High-pressure Low-Temperature Plasma Chemistry Symposium (HAKONE) and International Workshop on Microplasmas. He organized and co-organized conferences of HAKONE and ESCAMPIG in Brno, respectively. He was invited to be a member of the doctoral committees at the universities of Eindhoven, Toulouse, Bratislava, Granada or Pau. From the leading journal in the field PSST, he received the Outstanding Reviewer Award in 2020. For further information see the recommendation letters.

Conclusion: The applicant **is** a respected and recognized scholarly figure in his/her field. The applicant **has** made a significant contribution to the development of his/her field. The applicant **constitutes** a leading figure in his/her field of scholarship or research.

Evaluation Board Decision on the Nomination for Appointment to Professor

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 role as a respected and recognized scholarly or artistic figure, the board hereby submits a proposal to the Scientific Board of the Faculty of Science of Masaryk University to **appoint the applicant professor** of Physics of Plasma.

In Brno on 29.01.2025

prof. Mgr. Petr Vašina, Ph.D.