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Assoc. Prof. RNDr. Martin Kubala, Ph.D.
Dean of the Faculty of Science,
Palacký University in Olomouc,
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Letter of recommendation for associate professor, doc. Mgr. Jan Soubusta, Ph.D.

Dear Professor Kubala,

I am sending you the recommendation letter concerning associate professor Jan Soubusta's application for the full professorship. I have prepared it with pleasure, mainly because I appreciate a lot the scientific and teaching achievements of the Candidate and his participation in the work for the scientific community.

I met the Candidate for the first time about ten years ago. Since that time, I have had the pleasure of observing his scientific achievements. In my opinion, doc. Jan Soubusta is an excellent researcher who delivered many significant contributions, not only in fundamental but also in applied research. In particular, his scientific interests concern such fields as quantum and nonlinear optics in general, especially: laser physics, detection of light, quantum states engineering, new methods of photon pairs generation, quantum correlations of various types, quantum communication, design of quantum gates based on optical systems, and others. As a result, he is the author and co-author of numerous articles in various mainstream, highly recognized scientific journals. For instance, there were: *Physical Review Letters*, *Physical Review Applied*, *Physical Review A*, *Physical Review B*, *Applied Optics*, and others. In the database *Web of Science*, one can find 53 publications authored/co-authored by the Candidate (the state on November 5th, 2022). Those papers have been recognized by the optical community, and up to this time, *WoS* shows 770

citations of them (699 without self-citations), whereas H-index is equal to 18. From the lists of authors of the published articles, one can easily recognize that doc. J. Soubusta has built and established his own group of researchers. This fact is essential in considering the application for the full professorship. The scientific results obtained by the Candidate have also been presented in numerous international conference talks, which he and other members of his group co-authored. A significant part of those presentations was given as "invited talks." Moreover, doc. Jan Soubusta provided invited talks and seminars for numerous scientific groups in the UK, Germany, Poland, and others. Doc. Jan Soubusta also completed internships allowing for gaining the skills relevant to both pure scientific work and practical skills in the field of laser and nonlinear optics.

From the other side, doc. Soubusta was engaged in works related to various practical applications of optical and experimental techniques. One should mention here such results as preparing the system acting as the source of precisely time-correlated photons and generating photon pairs with the different spatial structures of modes guided in the waveguide. He was also involved in the design of optical quantum gates, for instance, the first in the world, a C-phase gate for controlled phase shift. Such a gate is the quantum analog of the classical C-NOT gate. Doc. Soubusta performed simulations concerning the influence of optical fiber noise on the communication link, and it allowed the development of optical systems corresponding to quantum routers and amplifiers. The Candidate was also involved in constructing a microscope apparatus for measuring the microphotoluminescence spectra of nanoparticles. He also dealt with scientific activities related to fundamental problems. For instance, there were testing Bell-type inequalities with an application of generalized GHZ states and checking conservation laws during unitary transformations when a transfer between the degree of coherence and the degree of correlations of the individual parts of the quantum system is present.

Doc. Jan Soubusta is also an experienced and active academic teacher. He gave lectures not only in the fields related to his current scientific interests concerning optics and photonics but also in other fields related to his previous carrier, such as nano-materials, solid-state physics, and experimental applied physics. The Candidate was also involved in teaching within the frame of Ph.D. courses. Moreover currently, he is a guarantor of the study program Instrument and Computer Physics since 2018. His pedagogical activity is not restricted to the PU in Olomouc. In 2011-2014, he was a committee member for the State Final Examination of Bachelor Degree in Optics and Optometry

at the CTU, Faculty of Biomedical Engineering in Kladno. Several times he was also a member of the State Examination Committees or opponent of doctoral theses at the Faculty of Electronics and Informatics, VŠB - Technical University in Ostrava, and Faculty of Science at the Masaryk University in Brno. Finally, it should be mentioned that he was awarded the Werner von Siemens Award for Ph.D. thesis supervision (1st place among the theses defended in 2012). The Candidate actively works for the scientific and pedagogical community of physicists. Since 2013, he has been the main organizer of the Summer School of Physics-Optics. The school is a one-week-long experimental optics course for high school students – the Candidate collaborated in that field with Prof. M. Bondani from the University of Insubria in Como, Italy.

Doc. Jan Soubusta works as a regular referee of scientific publications in leading journals such as Physical Review A, Physical Review Letters, Physical Review Applied, Optics Express, and Optics Letters. Additionally, Doc. Jan Soubusta actively participated in several grant projects and was also active in the works of the panel P205 of the Grant Agency of the Czech Republic. The Candidate was also involved in the organization of conferences and schools such as the Czech-Polish-Slovak optical conferences in 2000 and 2012, and the mentioned earlier repeatedly organized Summer School of Optics in the Joint Optics Laboratory of PU and IP CAS.

As a person who observed various activities of doc. Jan Soubusta, for more than ten years in scientific, teaching, and organization fields, I can state that he is an excellent and competitive researcher and an effective organizer of scientific research and didactic processes. He proved on many points that his scientific and didactic abilities allowed him to build his own group of researchers and lead young talented people on their scientific carrier path. What is relevant, he is also a very modest person.

At the final point of my letter, I want to emphasize that I am highly impressed by doc Jan Soubusta's research and teaching achievements. His activities for the scientific community also confirm my positive opinion concerning the Candidate's profile. Thus, I am highly convinced that doc. Jan Soubusta is an excellent candidate for the full professorship.

Wieslaw Leoński