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Prof. dr. hab. Adam Miranowicz  
Faculty of Physics, Adam Mickiewicz University  
ul. Umultowska 85, 61-614 Poznań, Poland; fax: +48 61 8257 758; phone: +48 731 742 369  
e-mail: miran@amu.edu.pl; <http://zon8.physd.amu.edu.pl/~miran>

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## Letter of recommendation for Ondřej Haderka, assoc. prof., RNDr., Ph.D.

I am glad to know that Ondřej Haderka, assoc. prof., RNDr., Ph.D., is now applying for the title of *Professor of Science* for his scientific achievements, as well as pedagogical activity and research organizational achievements. I hope my recommendation letter in support of this Candidate could be useful.

The Candidate defended his Ph.D. thesis on “Nonlinear dynamics of lasers in the regime of mode-locking” under the supervision of Prof. P. Malý at the Faculty of Mathematics and Physics of Charles University in Prague in 1995. He has been employed at the Joint Laboratory of Optics of Palacký University and the Institute of Physics of the Academy of Sciences of the Czech Republic (IP ASCR) since 1994.

It should be stressed that the Candidate was the Scientific Director of the Regional Centre of Advanced Technologies and Materials (RCPTM) in Olomouc in 2010-2019, and he has been the Head of the Joint Laboratory of Optics since 2013. These two facts show clearly his leading role in organizing the research in quantum optics in Olomouc in the last decade.

The Candidate has been performing fundamental and applied research in optics and quantum information. Both these research fields are closely related to quantum technologies. Specifically, the areas of his research in optics cover laser physics, quantum and nonlinear optics with a special emphasis on the detection of light. Moreover, his research in quantum information covers quantum cryptography, quantum communication, quantum random number generation, and quantum information theory including quantum entanglement and other types of quantum correlations.

I would like to mention a few technical points that might help you to be acquainted the areas, in which his contributions could be recognized, by awarding him the scientific title of professor.

Firstly, I would like to note that he is well known for his research works on quantum optics. As a recognition of his contribution to this field he has received a number of awards. These include the Alois Rašín Award (together with J. Valenta), *Journal Vesmír* in 1997 and the Otto Wichterle Award of the Czech Academy of Sciences in 2006.

His research interest is quite wide, but it is primarily focused on optical systems that lead to the generation and properties of nonclassical states of light (lucidly speaking, quantum optical states without having a classical counterpart) and their applications in quantum information, especially in the context of quantum cryptography.

Further, I would like to acknowledge that he has been systematically investigating both theoretically and experimentally the possibilities of the generation and stabilization of the sub-Poissonian photon-number statistics, photon antibunching, quadrature squeezing, and quantum entanglement of light beams in various optical systems. These studies have revealed many interesting results. The beauty of these investigations in quantum optics lies in the fact that in his works he often tries to answer important or even fundamental questions on both theoretical and applied levels.

His most often cited papers according to the Web of Science are: (1) on “Quantum identification system” (coauthored by M. Dušek, M. Hendrych, and R. Myška), (2) on “Multiple-photon resolving fiber-loop detector” (coauthored by Y. Řehaček, Z. Hradil, J. Peřina and M. Hamar) and (3) on “Direct measurement and reconstruction of nonclassical features of twin beams generated in spontaneous parametric down-conversion” (coauthored by J. Peřina, M. Hamar,