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IN THE SCHOOL OF ENGINEERING E-MAIL: JHARRIS@Stanford.edu  
September 21, 2017  
To: U.S. Citizenship and Immigration Services  
Re: Letter supporting Immigrant Visa Petition of Dr. Alexey Kovsh  
I am writing to strongly support the I-140 immigrant visa petition of Dr. Alexey Kovsh, who is  
applying as an alien of extraordinary ability in the field of laser physics in general, and in  
particular, the field of photonics and related engineering solutions. I understand that in order to  
demonstrate extraordinary ability in their field, an applicant must satisfy a number of criteria,  
including the receipt of nationally and internationally recognized awards in the field,  
membership in associations that require of their members outstanding achievements in the field,  
published material in professional publications relating to their work in the field, participation as  
a judge of the work of others in the field of endeavor, authorship of scholarly articles in the field,  
and a showing of a contribution of major significance to the field, among others. Being closely  
familiar with Dr. Kovsh's professional record and his outstanding achievements in his field of  
endeavor, I can say with absolute certainty that Dr. Kovsh fulfills the above-listed criteria. Dr.  
Kovsh authored a number of breakthrough inventions, which he described in his PhD and  
Doctorate research. His work has been published in leading international scientific journals and  
presented at major scientific conferences, clearly demonstrating his national and international  
acclaim in his field of research, namely high precision photonics and related engineering  
solutions. There are very few people in the world with Dr. Kovsh’s background and knowledge  
in this area and his contributions will be very important in advancing this important technology.  
By way of background, and to establish my own credentials, I briefly summarize the following: I  
received my Ph.D. in 1969 from Stanford University and I am currently the James and Ellenor  
Chesebrough Professor of Electrical Engineering, Applied Physics, and Materials Science at  
Stanford University. I have over 1000 publications and 28 granted US patents. I was elected to  
the National Academy of Engineering in 2011. I am a Fellow of IEEE, the American Physical  
Society, Optical Society of America, and Material Research Society. I received the 2000 IEEE  
Morris Liebmann Memorial Medal (one of the major IEEE awards). I am also the recipient of the  
2013 Semiconductor Research Corporation Aristotle Award for mentoring graduate students, an  
IEEE Third Millennium Medal and Humboldt Senior Research Prize (Germany) among many  
other awards. I served on the IEEE Fellow Evaluation Committee for 12 years, served on and  
chaired the IEEE Award Committees for the Noble Award and Nishizawa Medal and I am  
currently on the NAE Peer Review Committee, all providing exposure to and evaluating  
scientists of the highest level of achievement in my profession. I have supervised and graduated  
more than 130 Ph.D. students at Stanford University in the area of novel materials,  
optoelectronics, biosensors, spintronics and high-speed semiconductor electronics. I am also on  
the scientific advisory boards and the board of directors of seven US companies. In my research,  
I utilize heterojunctions, superlattices, quantum wells, and three dimensional self-assembled  
quantum dots to create metastable engineered materials with novel or improved properties for

electronic and optoelectronic devices. My research recently focused on integration of photonic  
devices and micro-optics to create a minimally invasive retinal prosthesis. My experience both  
academically and in consulting provide a foundation to compare many young scientists as well as  
making me aware of the critical need for outstanding talent in the rapidly developing applications  
of novel materials and nanotechnology to information, communications, energy and biomedical  
systems. I have reviewed Dr. Kovsh’s affidavit which he is submitting in support of his  
immigrant visa petition, and I am providing this affidavit based on his affidavit and based on my  
own knowledge of Dr. Kovsh’s research via familiarity with his publications and conference  
presentations, as well as based on my experience and expertise in the above described areas of  
research, which are very close to those of Dr. Kovsh.  
Dr. Kovsh is a world renowned expert in the field of high precision photonics and related  
engineering solutions, and his contributions have been recognized by numerous awards. His  
innovative ideas have been described in his publications in major scientific journals and  
extensively presented in the course of his invited talks at major scientific conferences. In the  
course of his scientific career, Dr. Kovsh authored more than a dozen patents and patent clusters  
in the field of electronics and photonics, in the US, the EU and in Russia.  
Contributions of major significance to the field of photonics and related research  
Dr. Kovsh authored a major research titled “Diode Lasers Based on InGaAs/AlGaAs/GaAs &  
InAs/InGaAs/InP Quantum Dots”. The result of his research was a crucial discovery of the first  
ever application of a non-equilibrium thermodynamic model to Molecular Beam Epitaxy (MBE)  
of InGaAlAsP material systems. This discovery was definitely a contribution of major  
significance to the field of photonics and laser physics, which has led to successful development  
of lasers based on self-assembled semiconductor quantum dots (Qds), which set the world  
records in power and efficiency.  
Dr. Kovsh was able to successfully apply his developed Molecular Beam Epitaxy technology to  
create the first ever fully temperature-independent semiconductor laser. The application of Dr.  
Kovsh’s invented technology provided a major breakthrough to solve the longstanding problem  
of semiconductor diode laser threshold current and output power on temperature, which arises  
because charge carriers (electron and holes) are spread over the density of states when  
temperature increases resulting to lower gain. In contrast, due to zero dimension density of states  
in Quantum Dots (QDs), it was theoretically predicted that a QD laser should exhibit  
significantly reduced temperature dependence. However, for a long time, the research  
community was unable to demonstrate such a result, until Dr. Kovsh implemented his specific  
technology to grow InAs/GaAs quantum dots and fabricated his innovative lasers with threshold  
current and power which did not change in the 20 to 80°C degree range, i.e. the typical range of  
operation of diode lasers. This important discovery was definitely a contribution of major  
significance to the field of photonics and laser physics, which enabled commercial  
implementation of high precision quantum dot laser technology for a broad range of applicatoins,  
from computing, to defense, to healthcare.  
I hereby state and confirm with reasonable degree of professional certainty that the above  
described innovations and discoveries are fully commensurate with Dr. Kovsh’s status as a  
scientist of extraordinary ability in the field of photonics and related research.

Receipt of major awards in the field of endeavor  
For the work described above Dr. Kovsh was awarded with the Gold Medal and the Prize of  
Alferov (Nobel Prize Winner in Physics, 2000) Foundation for the best R&D work in the field of  
natural science. I hereby state and confirm that this award is fully commensurate with Dr.  
Kovsh’s status as a scientist of extraordinary ability in the field of photonics and related research.  
Leading and/or critically important role at organizations of distinguished reputation  
In 2003–2009, Dr. Kovsh was employed in the leading and critically important position of the  
Chief Technology Officer at Innolume GmbH, Dortmund, Germany and Innolume Inc, Santa  
Clara, CA (in L1A visa status). Innolume is unquestionably an organization of distinguished  
reputation, the world leader in the development and manufacturing of lasers based on  
semiconductor quantum dots. Dr. Kovsh selected for this position based on his unquestionable  
reputation as one of the leading scientists in the world in the field of photonics and related  
research. Acting as the CTO of Innolume GmbH, Dr. Kovsh led extensive research in the field of  
diode lasers based on self-assembled InAs/GaAs quantum dots. In 2007, Dr. Kovsh invented,  
and later, led team of Innolume to implement, a unique diode laser solution, called the comb-  
laser. This laser has multiple wavelengths with ultralow partial intensity mode noise. Dr.  
Kovsh’s develped combination of a comb-laser design with silicon photonics is an effective  
solution for inter-chip and intra-chip optical communications, which allows to greatly speed up  
the data transmission capabilities, as described in a joint recent paper by Hewlett Packard and  
Innolume, published by IEEE. Dr. Kovsh described the results of his research in a highly cited  
article in a major professional publication, Optical Letters. For this invention, Innolume was  
selected as the most innovative diode laser company in North America by Frost & Sullivan in  
2008. Dr. Kovsh’s role in this organization was definitely leading and critical, which is fully  
commensurate with his status as an expert of extraordinary ability in the field of photonics and  
related engineering solutions.  
In 2010–2012, Dr. Kovsh’s was employed as the Executive VP at Optogan CJSC, St. Petersburg,  
Russia, heading several of the company’s divisions. In 2012 – 2014, he was employed as the  
CEO of Optogan Lighting GmbH, Landshut, Germany. In 2013 – 2014, Dr. Kovsh served as the  
Board Member of JV Philips Lighting – Optogan in St. Petersburg, Russia. Originally started in  
Finland as an R&D house for gallium nitride on sapphire epitaxial technology with a main focus  
in LEDs, Optogan is definitely an organization of distinguished reputation, as it has grown into a  
major vertically-integrated international holding developing and producing LED chips, LED  
packages, electronic drivers, lighting fixtures, and intelligent systems for general lighting. Dr.  
Kovsh’s role at this organization was definitely leading and critical, which is fully commensurate  
with his status as an expert of extraordinary ability in the field of photonics and related  
engineering solutions.  
In 2015, Dr. Kovsh was employed in the leading role of Executive Vice Presidence for Civil  
Markets and Products, at JSC Avangard, St.Petersburg, Russia, an organization if distinguished  
reputation as the oldest R&D and Production Enterprise for microwave electronics nationally.  
The enterprise mainly manufactures microwave electronics, including SAW-based sensors for  
RFID, as well as gas, deformation, and flux flow sensors. Dr. Kovsh applied his expertise in  
order to successfully set up the R&D department and launch commercial products in the

inovative Internet-of-Things field, which was the first comprehensive and significant effort by a  
commercial firm in this field in Russia. Dr. Kovsh’s role at this organization was definitely  
leading and critical, which is fully commensurate with his status as an expert of extraordinary  
ability in the field of photonics and related engineering solutions.  
In October 2015 – March 2017, Dr. Kovsh served as the Director of Business Development and  
Research at Princeton Optronics, Inc., New York, USA. Princeton Optronics is a privately-held,  
venture-funded company with 40 employees engaged primarily in the development and  
manufacturing of high-power vertical-cavity surface-emitting lasers (VCSELs) for various  
market applications such as 3D imaging, proximity sensing, laser range finding (LiDAR) for  
self-driving cars, laser hair removal, and laser projectors for movie theaters. VCSEL products  
from Princeton Optronics Inc. are also used in military applications. Dr. Kovsh employed his  
extraordinary expertise at this company in order to identify the proper market niches, acquire  
joint development projects with the customers, and direct R&D activities of the company to  
address these opportunities. The results of his work helped shareholders sell the company in  
March 2017 for $53.3M to AMS. Dr. Kovsh’s role at this organization was definitely leading and  
critical, which is fully commensurate with his status as an expert of extraordinary ability in the  
field of photonics and related engineering solutions.  
Authorship of scholarly articles in major professional publications  
Dr. Kovsh published his research in such major professional publications as Vacuum Science &  
Technology, Electronics Letters , and Applied Physics. I hereby state and confirm that Dr.  
Kovsh’s authorship of scholarly articles in his field of research is fully commensurate with his  
status as a scientist of extraordinary ability in the field of photonics and related research.  
Intent to continue working in the field of endeavor  
Dr. Kovsh is currently employed at Masimo Corporation, Irvine, CA, USA. Masimo is a publicly  
traded global medical technology company (NASDAQ: MASI) with market value of above  
$4.5B. The company develops and manufactures innovative noninvasive patient monitoring  
technologies, medical devices, and a wide array of sensors. Today Masimo sensors help  
clinicians monitor in excess of approximately 100 million patients in healthcare settings around  
the world, and its pulse oximeter technology is used by 17 of the top 20 hospitals on the U.S.  
News & World Report Best Hospitals Honor Roll for the 2016-2017 year. Masimo employs over  
4,000 people worldwide, with annual revenues of approximately $700 million. Dr. Kovsh is  
applying his expertise in order to develop and transfer to high volume manufacturing a core  
technical part of company technology which provides optical sensing of blood parameters. This  
work involves intensive development of new designs and fabrication principles of semiconductor  
nanoheterostructures like LEDs and PDs, and I have no doubt that Dr. Kovsh’s extraordinary  
expertise will allow him to be completely successful in this endeavor.  
I am positive that Dr. Kovsh will continue working in his area of expertise in order to develop  
new competitive products addressing the most promising market areas, including noninvasive  
medical technologies. Dr. Kovsh will certainly be an asset to any organization for which he  
works and he will certainly be an asset to the United States in this rapidly advancing and critical  
technology area if granted US permanent resident. I have no doubt that the benefit from Dr.  
Kovsh’s continued employment in his field of research will be of national caliber, and it will

benefit not only the companies employing him, but will significantly benefit his field of research  
as a whole. Therefore, I strongly recommend your approval of Dr. Kovsh’s immigrant visa  
petition.  
Please let me know if I can provide any further information in this regard.  
Sincerely yours,  
James S. Harris  
James and Ellenor Chesebrough Professor  
Department of Electrical Engineering,  
Materials Science and Applied Physics  
National Academy of Engineering