**STATEMENT OF PURPOSE**

**Preface**

As a 20-year-old graduate student, I have had the definite academic goal as to be a highly successful scientist. My undergraduate and Master-oriented graduate studies have given me well knowledge in both Electronics and Physics. Electronics is the foundation of modern industry, while Physics is the foundation of science. My doctoral graduate study in Engineering School of Stanford University, if admitted, will be devoted to interdisciplinary study in about Electronics, Physics and some other topics.

**Past Years**

My parents had enlightened me since I was born. With strong desire to study I entered the primary school when 5-year-old and finished its 6-year program in 5 years. I studied hard and entered the high school when I was 10 and finished the 6-year program in 4 years. In my high school years, I was very interested in mathematics and physics, and obtained many honors in related contests.

Six years ago, I, a 14-year-old boy, enrolled in the Special Class for Gifted Children (SCGC) at XXX University as the youngest student. SCGC is the most selective and competitive class in XXX Univ., yet I kept the highest GPA and was the monitor of the class. The aim of SCGC is to give the young gifted students formal and strict training in mathematics and physics that is more advanced than that of normal undergraduate students.

My study at SCGC bestowed me a competitive spirit toward challenges and an intense curiosity in Electronics. I took specialized study in the Department of Electronics at XXX Univ., the only department founded for major in China. I also took physics major coursed in the Physics Department, many of them were taught in English and used the best books. With the physics foundation I received, it was easier for me to grasp the essential concepts in major and faster my study.

I was the first student who finished the 4-year undergraduate program in 3 years. Although the grading system is strict, my GPA was top 1among 50 students. My under-graduate study brought me many honors, such as the Huawei Prize, awarded to “most brilliant and diligent” students only. In 2000 I was among the 10 “most excellent” university students who received Wusi Prize. In 2001 I graduated from XXX Univ. with the Bachelor of Engineering degree. I won the honor “Most Outstanding Graduate” that is awarded to top 1% students only.

With the intention of studying further Physics in an applied viewpoint, I enrolled in the Department of Physics at XXX University。 Graduate study here emphasizes independent learning and research, and I tried to study Physics using my knowledge in Major. Besides the course study in the first year, I studied by myself much knowledge in MS Major and Major, and engaged in research positions in several different groups.

I participated in many experimental and theoretical research projects and enjoyed the UNIX scholarship as well as many other prizes for my research. I tried to include extensive research topics in my graduate research, ranging from this to that. I have had much experience to do independent research while cooperate with others closely. I will get the Master of Science degree in June 2004 when I am 20 years old.

**Research Aptitude**

A successful scientist is firstly a successful researcher. In view of this, I have particularly noticed to develop my own ability of independent learning and research in my past years of study in physics and engineering science. I have had research experiences in various fields, such as mesoscopic physics, condensed matter theories and experiments, optical physics, laser technology, quantum optoelectronics and microelectronics. It is in my done independent work that I felt for the first time the thrill of discovering things known to no one else in the world.

My research career started from the projects of optoelectronic device design and optical fiber communication under the direction of Prof. De Liu, Chair of the department of electronic engineering at XXX University. I studied the band structures of optoelectronic materials and the setup of low-loss optical amplifiers. I applied well the physical concepts I know to optoelectronics in these projects and designed the practical fiber communication system. My performance enabled me to be among a few excellent students who were admitted to join the National Laboratory of Laser Technology.

The Vice director of this lab, Prof. Zhenhua Lu, instructed me to do research in high-power laser radiation and interaction with matter. This research resulted in my Excellent Bachelor degree dissertation and a number of honors (refer to my resume please) as well as nice application to the perforation techniques. The 9 months at this lab game me a comprehensive training in laser technology, including experiments in laser spectroscopy and various kinds (solid-state, gas, semiconductor, etc.) of lasers.

My study in quantum electronics continued after I arrived to XXX University. I took the course <Laser Technique and Application> and my “A” score brought me access to the National Integrated Optics Laboratory, where I tracked the newest progresses in optoelectronics. Particularly I took study in high-speed optoelectronics and optical wave guides. I was an assistant engineer at the Huawei Technology Co. Ltd. (Shenzhen, China) in summers of 1995 and 1997. the research I did there in VLSI design and microelectronics is part of the related National project. I have been a research assistant in applied electronics, system science, and electrical engineering under the direction of Prof. Qiang Qian. He gave me systematic training to do complex experiments. I tried my best to apply my physics knowledge to these experiments and arrange things in order.

While my research in optics and electronics was in progress, I paid more attention to condensed matter physics for my Master degree thesis, which will include two main subjects: mesoscopic physics and physics of nanoscale materials. I read many references in the field of transport and cooperative phenomena in low-dimensional systems. I learned by myself the standard methods to analyze highly correlated quantum many-body systems, including the renormalization group method and the random matrix method.

My advisors, Prof. Qi-Sun Ye and Prof. Ji-Jiong Xia, encourage me to study solid-state physics, I did much work in mesoscopic physics at the YYY Laboratory (XXX Univ.) under the direction of Prof. Bei-Yi Tang. I studied the transport phenomena, single-electron transfer, strong electron-electron interaction, and persistent currents in mesoscopic systems. Being very interested in studying properties of carbon XXXs and other promising new nanoscale materials, I studied the electronic transport phenomena in carbon XXXs and the impact of impurities. A recursive green’s function method is set up to analyze such low-dimensional systems.

I also did many experiments in spectroscopic determinations of transport in nanostructures, and fabrication of carbon/boride/nitride XXXs. Other topics I studied include quantum interference effects, physics of quasiperiodic series, fractional quantum Hall effects, electronic wave scattering on superconductor surfaces, etc. my research in highly correlated systems, quantum dots, and quantum well optics is now in progress. My specialized knowledge in bio membrane physics comes from the research discipline I received at the Biophysics Laboratory.

My past research experiences have given me an unwavering spirit to overcome difficulties I might face in the future. Up to now, I have participated in 3 national research projects, and have written 7 papers in the past one year. As I am very young, I am mostly interested in doing important research work with my vigor and creativity in science. I wish to go ahead and study further fundamental physics problems that have nice application prospects.

**Prospects at Stanford**

The xxx Department at Stanford attracts me as my best choice to do doctoral research in the area between physics and electronic engineering. Stanford University ranks the first in electrical engineering, and has Nobel laureates in physics for three consecutive years. What attracted me more is that my major research interests have a good match to so many Stanford faculty members. It is indeed stimulating to find the opportunity for new students to join at once the first-class research projects at Stanford.

With my past research experience, I am confident that under the direction of distinguished Stanford’s professors, my potential can develop into advanced knowledge and ability in xxx. If possible, my main interest in the future will be focused on lasers and quantum electronics, condensed matter physics (theory and experiment), and biophysics at Stanford. In these areas, I have been familiar with the first-class research work done by corresponding Stanford professors, and willing to do further research under their direction. As a tentative list, my background in solid-state physics, optical physics and electronics seems perfectly fit these research topics at Stanford:

Condensed Matter Physics: synthesis of new materials and study of electronic structures, mesoscopic physics, nanometer-scale science, transport phenomena, cryogenic physics, bio membrane physics, superconductors, correlated systems, quantum Hall effect, etc.

Laser technology: solid-state laser devices, laser spectroscopy and laser physics, quantum electronics, QED theory of microcavities and trapped atoms, ultrafast lasers, nonlinear optics, lasers without population inversion, laser biomedicine, etc.

These topics are only the topics with which I have been very familiar. As I have already had various research experiences, if you feel that I am more suited for some other topics, I would like to take endeavors in them as well. I feel that I am qualified to study Physics both theoretically and experimentally. It is my plan to engage in research at Stanford, and prepare for myself both the most advanced theoretical methods and the newest experimental skills in Physics. I wish to be a recognized versatile researcher upon graduation from Stanford when I am roughly 26 years old. I will then take my best efforts to contribute to the advancement of Electronics and Physics. This is my dream as a successful scientist, and I wish to actualize it step by step at Stanford.