



Recommendation letter for Dr. Qingkai Qian

Dear university committee,

I am more than glad to write this recommendation letter for Dr. Qingkai Qian to apply for the faculty position in your institution. I am Dr. Qingkai Qian's supervisor during his master degree study in Department of Physics, Tsinghua University, from 2012 to 2014.

Before Dr. Qian became my master student, I already supervised his undergraduate thesis in the Department of Physics of Tsinghua University. Dr. Qian had shown great qualities in academic research at the early stage when he just joined my group. The first quality I must mention is that he was always enthusiastic and eager to learn. He conducted discussions with the senior members in my group whenever he caught a chance, through which he quickly learned about the experimental skills and got familiar with our equipment, including SEM, semiconductor parameter analyzer, ultrasonicator, photolithography and so on. Since the intense communication and close cooperation are more and more paramount nowadays during the academic research, I believe this is definitely an important quality for a successful researcher. Dr. Qian had conducted excellent work about carbon nanotube (CNT) dispersion and thin film transistor (TFT) fabrications in my group during completing his undergraduate thesis. When he encountered problems, he was capable of thinking out of the box and grabbing more information for further analysis. His undergraduate thesis impressed the committee a lot, and was selected as the best undergraduate thesis in Department of Physics.

Dr. Qian continued his master degree study in my group after obtaining his bachelor degree. He conducted further in-depth study of the performances of CNT TFT. What I would like to mention is Dr. Qian's strong sense of curiosity and strong desire to inquiry the unknown phenomena, with a critical and independent thinking. I believe this strong passion to explore is the first step toward successful research. He conducted a controlled experiment to study the influence of air adsorption over the CNT TFT performance. A detailed experimental analysis

found that the mechanism of the p-type conductivity of CNT TFT is due to the O₂ adsorption and the trap-dominated suppression of electron conduction. The related work is latter published on ACS Nano, which is quite impressive for a two-year master student. Dr. Qian also possessed a remarkable handling of theoretical modeling. In my group, we tried ionic gel as a high-capacitance gate dielectric to modulate the conductivity of graphene transistor. An peculiar ambipolar conduction was observed in the output curves. Dr. Qian modeled the I-V characteristics using an analytical physics model, and achieved excellent agreement with the experiment. The related work was published on Journal of Applied Physics.

Based on the three years' supervision of Dr. Qian in my group including his undergraduate thesis, I have known Dr. Qian's personality quite well. Dr. Qian possesses a great enthusiasm in exploring the unknown, and he has an excellent mastering of both experimental skills and theory, which I believe will continue to contribute to his research in the future. So Dr. Qian is definitely the one I would like to recommend to you without any reservation.

Sincerely,



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