



DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING  
COCKRELL SCHOOL OF ENGINEERING

2501 Speedway • EER Building WNCG Room 3.830 • Austin, Texas 78712 • (512) 518-7064

October 31, 2018

Dear Faculty Search Committee:

I am writing to apply for a tenure-track faculty position in Physics Department at Texas Tech University. I am currently a postdoctoral fellow working with Prof. Andrea Alù in University of Texas at Austin. I got my PhD in Condensed Matter Physics from University of California, San Diego in 2017, working with Prof. Dmitri N. Basov. I believe my research interests and achievements, scientific enthusiasm and motivation as well as teaching experience, make me well qualified for the stringent criteria of this position.

My current research covers a broad range of topics in low-dimensional materials, quantum materials, biomaterials, nanophotonics and near-field optics. In fundamental science, I have contributions to nano-optics in van der Waals (vdW) materials by building the concept of natural hyperbolicity with discoveries of phonon polaritons in hexagonal boron nitride (hBN) and hybrid plasmon-phonon polaritons in graphene/hBN heterostructures. In terms of applications, I have accomplished record-high-resolution focusing, imaging, steering of propagating polariton waves and polaritonic internal structure diagnosis in the nanoscale and nano-optical lithography. All my **first-author works** were published in top journals including *Science*, *Nature Nanotechnology*, *Nature Communications*, *Advanced Materials* and *Nano Letters*. I have also been **invited** for conferences and seminars such as the **APS March Meeting** and **MRS Spring Meeting**.

In my career, I plan to build a **nano-optics** research group working on emerging **quantum** and **biomaterials**. My research group aims to characterize fundamental physical properties of emerging quantum and biomaterials and develop their applications in bio sensing, energy transfer, quantum information and applied electromagnetics with the help of **machine learning** as well as conventional simulation. I am eager to collaborate with faculties in emerging material synthesis, optics and plasmonics, biomaterials and biophysics, phase transformations, topological and quantum materials and theory and computation to attract external funding (NSF, NIH, DOE, ONR, AFSOR, ARMY, DARPA, DTRA etc.) for our research. I believe Texas Tech University provides a world-class environment to achieve my career goals. The physicists there conduct high-profile research on emerging material synthesis, electronic, magnetic, thermal as well as optical and photoelectron spectroscopy characterizations where my expertise in near-field optics and quantum materials can serve as a perfect complementation.

I would like to emphasize my commitment to excellence in both research and teaching as these are complementary goals in my career. My teaching skills and experience learnt from teaching assistant in different levels of courses and mentor for undergraduate and graduate students sufficiently demonstrate my qualifications. I would be happy to all fundamental physics courses especially optics and electrodynamics at the undergraduate level and nanotechnology, low-dimensional materials, nanophotonics, near-field optics, metamaterials and plasmonics at the graduate level.

My application materials, including the curriculum vitae, research statement and teaching statement have been submitted online. Please feel free to contact me if you want more information and materials.

Thank you very much for your consideration, I look forward to hearing from you in the near future!

Sincerely,

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