Executive Summary for a Promotion Application from Associate Professor to Full Professor

I am an Associate Professor in the Department of Chemical and Materials Engineering at New Mexico State University (NMSU). After receiving a Ph.D. degree in Chemical Engineering at Tulane University in 2006 and working as a postdoctoral research fellow at Los Alamos National Laboratory for three years, I joined NMSU in the fall of 2009 as a tenure-track Assistant Professor and I was early promoted to an Associate Professor with tenure in 2014. Here I submitted an application for a promotion from Associate Professor to Full Professor. The following is my accomplishment summary for Teaching and Advising, Research, Scholarly and Creative Activities, Professional Service Activities, and Leadership role during 2014 – 2018.

(1) Teaching & Advising

Highlight: recipient of 2014 Bromilow Award for Teaching Excellence in the College of Engineering at NMSU; 6 Ph.D. students have graduated in my group and 2 are faculty members.

I taught a graduate core course CHME 542 Graduate Reactor Analysis and Design, Spring semester 2015-2018; an undergraduate core course CHME 302 in Fall semester 2014-2018; undergraduate core course CHME 302L in Fall 2014; Undergraduate core course CHME 441 Chemical Kinetics and Reactor Engineering in Spring 2014; Graduate seminar CHME 590/690 in Spring 2014, Fall 2015, Fall 2016; In addition, I created and taught elective course CHME 467/567, Phys. 450/520, Nanoscience and Nanotechnology for both undergraduate and graduate students in science and engineering (The course is cross-listed with Physics department), in Spring 2014, Spring 2015, Spring 2016, Fall 2017. I also attended workshops in NMSU Teaching Academy and workshops in graduate school; participated in ABET (Accreditation Board for Engineering and Technology) Accreditation 2018 for Chemical Engineering and Engineering Physics; supported for ASEE (American Society for Engineering Education) Summer School in 2017 (for Chemical Engineering faculty, once every five years) to improve teaching and students learning skills and resources. My annual teaching/advising evaluation from our Department Head was "very good", "excellent/very good" and "excellent" in 2014-2017.

I am actively mentoring students in conducting research. Since 2014, I have mentored **11 undergraduate students** and 6 of them have joined graduate school in Florida University, UT Austin and NMSU; **7 high school students** and 5 of them have co-authored journal publications. Currently my group has **5 undergraduate students** and **1 high school student**. Some of the students are recruited from NMSU existing programs: NSF-Alliance for Minority Participation (New Mexico AMP) program, Summer Community College Opportunity for Research Experience (SCCORE) program, NIH supported Minority Access to Research Careers (MARC) program, S-STEM Scholarship Program and NM EPSCoR STEM Advancement Program. In March 2018, I was selected and supported with two minority sophomore-level undergraduate students for Purdue Early Pathway Program: two-day workshops, facilities tours, and undergraduate students considering graduate school preparations. My undergraduate students have been supported and received numerous awards, such as NASA Space Grant Fellowship, WRRI Water Research Award, Los Alamos National Laboratory summer internship, and University of Nebraska Lincoln MRSEC Summer Research opportunity. In addition, I have actively recruiting and mentoring

undergraduate ECUST (East China University of Science and Technology) exchange students (3+1 program) for course evaluation and credit transfer.

As the department graduate program coordinator / graduate student academic advisor, I am helping department to recruit graduate students and advise graduate students for taking classes. I also present the graduate handbook/catalog for the new graduate students in the seminar ChME 590/690. In my research group, since 2014 to 2018, **6 Ph.D. students** and **7 thesis-based Master students have graduated with degree at NMSU**. Currently my group has **1 visiting professor**, **6 Ph.D. students**, **1 visiting Ph.D. student**, and **1 MS student**. Among the graduated students, **Ling Fei** is a tenure-track Assistant Professor in Chemical Engineering at the University of Louisiana, Lafayette; **Gen Chen** is an Associate Professor in Materials Science and Engineering in Central South University, one top university in China; and **Weichuan Xu** recently secured an Associate Professor in Chemical Engineering in Huaiyin Institute of Technology, China. My students have received many awards from NMSU as well as from international societies. For example, 4 students have received the Preparing Future Faculty Graduate Assistantship Award, one of the highest merit awards given to graduate students at NMSU, and Ling Fei was one of them. Gen Chen received two prestigious awards: 2015 ECS Edward G. Weston Summer Fellowship from the Electrochemical Society (ECS) (one of the five winners all over the world in ECS); 2015 Chinese Government Award for Outstanding Self-financed Students Abroad from China Scholarship Council due to his excellent Ph.D. studies at NMSU (the award is to celebrate the achievements of non-Chinese-government funded Chinese Ph.D. students from all disciplines in 29 countries, less than 500 a year all over the world, the first one at NMSU since the award was founded in 2003). In Gen Chen's thesis, he acknowledged, "As a Ph.D. candidate, I cannot emphasize too much the importance of my Ph.D. advisor Dr. Luo's unreserved support to me on building academic connections, nominating me for many awards, giving me many opportunities to present my work to the research community, recommending me for the Los Alamos National Lab research chance, and so on, which bring long-lasting and important benefits to my future career".

(2) Funded Research

Highlight: Funded projects: **13**; Total funding involved: $23.3M and my portion: **$1.25M**; 2017 recipient of the first Luke Barry Shires Endowed Professorship; 2016 Robert L. Westhafer Award for Excellence in Research and Creative Activity at NMSU *(the Westhafer Award is among the highest honors that NMSU awards faculty);* 2016 Distinguished Career Award from the University Research Council for Exceptional Achievements in Creative Scholarly Activity at NMSU; 2016 Nanoscience Research Leader Award from the Cognizure publisher; 2015 Bromilow Award for Research Excellence in the College of Engineering at NMSU.

I appreciate the continuous support from the department, college and office of the Vice President for Research at NMSU. My Thin Films and Nanomaterials Laboratory at NMSU focuses on nanostructured materials (quantum dots, nanoparticles, nanowires) for photovoltaic solar cells, photocatalyst, electrocatalyst, lithium-ion batteries, fuel cell, electrolyzer and epitaxial oxide, nitride, and their nanocomposite thin films for superconductivity, transparent semiconductors, magnetic, and multiferroic applications. I have collaborated with many faculty members in the Departments of Chemical & Materials Engineering, Physics, Chemistry, Mechanical Engineering,

Civil Engineering at NMSU, as well as with faculty at the University of New Mexico, New Mexico Tech, University of Texas at San Antonio, University of Texas at Rio Grande Valley, University of Nebraska, Lincoln, Penn State University, MIT, University of South Carolina, Georgia Tech, University of Wyoming, Argonne National Laboratory, Los Alamos National Laboratory, and Idaho National Laboratory. Since 2014, I have had **13 funded projects** from NSF, Los Alamos National Laboratory, Argonne National Laboratory, and USDA, etc. I participated in total of $23.3 M funded projects and my portion is **$1.25 M**.

(3) Scholarly & Creative Activities

Highlight: total 56 peer-reviewed journal publications; 46 of them are co-authored with graduate, undergraduate, and high school students. 1 Conference Proceeding. Citations: 3000+; H-index 30; Invited talks: 17; Conference presentations: 56.

It is no doubt that high quality students are the most important students for our career success. I always feel so lucky to have colleagues to collaborate and have excellent Ph.D. students in my research group. Within the past four years at NMSU, my research group has published **1 Conference Proceeding** and **56 peer reviewed journal papers** (including 1 under review), such as *ACS Nano (impact factor: 13.709), Nano Energy (13.12), Nanoscale (7.367),* and *Adv. Mater. (19.791).* 46 of them are co-authored with my group graduate, undergraduate, and high school students. Our publications have gained **3000+ citations** and **my H-index is 30**. One of our papers in Nanoscale 2014 was highlighted in Renewable Energy Global Innovations. In addition, **1 book chapter** was invited in 2017 and was submitted recently. I have supported graduate, undergraduate students and one high school student to attend MRS, ECS, and AICHE conferences. My group presented **17 invited talks** and **56 oral/posters** in conferences, workshops and universities since 2014. 54 of them were presented by my students.

(4) Service, Extension & Outreach

Highlight: Journal Editorial Board; proposals and journal review; conference symposium organizer and session chair; founder and faculty advisor of an ECS student chapter; committee member in department, college and school.

I participated in several service activities within profession. I am a member of AIChE, MRS, ACS, ECS, and ACerS. I am served on the Editorial Board in various journals: *Applied Materials Today* (Elsevier), *Aspects of Nanotechnology*, *General Chemistry*, *Engineered Science,* and *Materials Science: Advanced Composite Materials.* I was frequently a guest editor for special topics in various nanoscience and nanotechnology related journals. I am a reviewer for the DOE Center for Integrated Nanotechnologies (CINT) user proposals, ACS PRF proposals, panelist on various NSF panels (one panel was for $20M/each research center proposals), and I usually review 50-100 papers for 30 journals per year. I was organizing a MRS (Materials Research Society) Symposium in Spring Meeting 2018 and received $5500 from fundraising, used for supporting the symposium. In addition, I am a faculty founder and advisor for electrochemical society (ECS) student chapter at NMSU, and we have outreach activities to local middle school and high school students and serve as judges for students' science fair projects.

At NMSU, I have served as a member of the University Research Council for two years. Currently I serve the Westhafer Award Committee as the only representative for the College of Engineering, and also in the College Graduate Program Committee, College Award Committee, and College Students Publication Committee as the only representative for the Department. I have served in the Engineering Physics Program as the only representative for concentration in Chemical Engineering and works for ABET evaluation with Department of Physics. I have been the Department Graduate Student Program Coordinator to recruit and bring in graduate students.

(5) Leadership

For Teaching and Advising: I am the department graduate program coordinator. I am responsible for coordinating the evaluation of graduate school applications and serving as the students' advisor in admission and enrollment matters until the student has identified a research supervisor from among the faculty in the department. My research group has graduated 6 PhDs in 2014 – 2018 and 2 have been faculty members since Jan. 2018. I am also taking an important role in the undergraduate exchange program between East China University of Science and Technology (ECUST) and our department at NMSU (3+1 program). In addition to students, I have served as a mentor to some junior faculty members in the department and other departments at NMSU. I provided new faculty a complete electronic set of files (lectures, exams, quizzes etc) for courses that I had previously taught.

For Research, Scholarship and Creative Activities: I have effectively participated in multi-investigator proposal teams and have a leadership in developing shared research laboratory capabilities. I am the PI for a NSF MRI award for *atomic force microscope instrument*; co-PI for *X-ray diffraction instrument acquisition* from DOD, *I-Corps Site at NMSU* from NSF, and *an educational grant from USDA* by coordinating with other three universities. I have been involving in NSF supported NM EPSCoR project for the past five years. As a lead in the Solar Power Team at NMSU, I am coordinating with other universities in New Mexico and responsible for future strategies, data uploading, reporting, and annual report for NMSU. Recently, I am the PI for NSF PREM proposal with $4.2M, collaborating with 11 other faculty members at NMSU and 10 faculty members at University of Nebraska-Lincoln. I am also a Co-PI for another two multi-million dollars projects, collaborating with Idaho National Laboratory, MIT, Georgia Tech, University of Wyoming, and University of South Carolina etc. In scholarship and creative activities, I am the PI for the Thin Films and Nanomaterials Laboratory with 10+ graduate and undergraduate students per year. Since 2014, my research group has published 56 peer-reviewed journal publications, 17 invited talks and 56 presentations in conference and workshops. Those activities demonstrate my leadership role in research, scholarship and creative activities.

For Service and Outreach: I serve as the department graduate program coordinator and I am taking an active role in recruiting graduate students. I am also a founder and a faculty advisor of the electrochemical society student chapter. We have outreach activities to local middle schools and some other programs on campus, for example Discovering Diversity in Engineering: Women in STEM. I also presented a talk in Las Cruces Science Museum. I was invited for NSF multi-million research center proposals review panel; served on various journal editorial boards and a guest editor for special issues; organized a MRS conference symposium. I was also invited to write a tenure/promotion support letter for a junior faculty in other university in 2017.

In summary, I have used the resources available at NMSU to improve skills as a teacher and mentor, and have leveraged successful research program by collaborating within NMSU, other universities, and national laboratories. The department, college, and school, have been very helpful and supportive on my career development and growth. Based on my accomplishment in Teaching, Research, and Service, I believe I am qualified to be promoted to a Full Professor. I appreciate your consideration and support!