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Search Committee  
Texas Tech University  
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Dear Search Committee,

The recipient of the 1939 Nobel Prize in Chemistry Lavoslav Ruzička is rumored to have once opined “*Ein Kristall ist ein chemischer Friedhof*” – a crystal is a chemical graveyard. Though certainly a remarkable quote from a brilliant scientist, any devotee of correlated electron materials knows the chemical graveyard of a crystal can be a façade beyond which lies a compelling, rich and challenging landscape of exotic physics and quantum phenomena. It is in the adventure of such pursuits of understanding that I have applied my research and which I would endeavor to continue as a professor at Texas Tech University.

Of the rich playground of correlated materials, I have approached its study along two perpendicular paths – building a localized expertise in studying unconventional superconductors while arming myself with the wider applicability of being an expert in the techniques of neutron and x-ray scattering. As a graduate student at Northern Illinois University I joined Argonne National Laboratory’s Neutron and X-ray Scattering Group (NXS) as their first graduate student member, I secured my own funding through a fellowship and graduated with the award of Outstanding Graduate Scholar for physics. These latter two were bestowed for the work of my dissertation pointing to the fundamental mechanism driving unconventional superconductivity in the iron-based superconductors. Meanwhile, as a member of the NXS I trained under pioneers of neutron and x-ray scattering techniques, became a successful proposal writer and built my reputation throughout the community and the scientific staff at synchrotron x-ray and neutron scattering facilities across the US and UK. My post-doctoral fellowship was offered to me by a collaborator at Oak Ridge National Laboratory (ORNL) who was impressed by my research and has allowed me to continue in my growth as an expert in neutron scattering – as evidenced by my recent invitation to give a lecture at the 75<sup>th</sup> Pittsburgh Diffraction Conference extolling the applications of neutron diffraction.

At ORNL, I have developed an independent research program which spans collaborations across departments, fields and laboratories with the goal of studying quantum phenomena in low dimensional systems, while also being responsible for the operation and development of a neutron powder diffraction beamline at the High Flux Isotope Reactor. As part of this work I have helped develop the extreme environment capabilities on the powder diffractometer – recently successfully running a new large volume 1GPa powder pressure cell designed especially for the needs of a powder diffractometer. Wishing to help build the post-graduate community at ORNL I ran and was elected as an executive officer of and have volunteered as a committee vice-chair for ORNL’s Postgraduate Association - ORPA. With this position I worked to build a more cohesive, inclusive postgraduate community through organizing gatherings for the informal sharing of research and scientific interests as well as opportunities for postgraduates to learn how to communicate their science to the public.

As a correlated materials researcher with a growing expertise in the techniques of neutron and x-ray scattering and a collaborative network across national laboratories, I would bring a unique capability to Texas Tech University. I am deeply committed to the philosophy of community and diversity and would take full advantage of the University’s facilities to the best outcomes for its students. I would utilize my research expertise and wide network within the national lab user facilities to build a world class research program, continuing my research of unconventional superconductivity and quantum materials. Moreover, my experience with scattering and magnetic

materials would complement well the research of the University's Physics Department while also expanding the capabilities through new connections to the neutron and x-ray scattering facilities at ANL and ORNL.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith M. Taddei". The signature is written in a cursive, somewhat stylized font.

Dr. Keith M. Taddei

Reference #1

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