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PROFESSIONAL PREPARATION

1969 B. S. (Honors in Physics), First Position, Class of 1969, University of Karachi, Pakistan
1970 M. Phil (Physics), Islamabad University
1977 Ph.D. (Physics), University of Rochester; *Advisor: R.S. Knox*
1977-1979 Postdoctoral Associate, University of California, Irvine; *Mentors: D.L. Mills & A.A. Maradudin*

APPOINTMENTS

2012 - Pegasus Professor, Department of Physics, University of Central Florida
2006 - Distinguished Professor, Department of Physics, University of Central Florida
2006 - 2015 Chair, Department of Physics, University of Central Florida
2001 - 2006 University Distinguished Professor, Kansas State University
1991 - 2001 Professor, Kansas State University
1986 - 1991 Associate Professor, Kansas State University
1983 - 1986 Assistant Professor, Kansas State University
1979 - 1982 Assistant Research Physicist, University of California, Irvine

VISITING APPOINTMENTS

Visiting Scientist, Donostia International Physics Center, San Sebastian, Dec 1, 2016 – Feb. 1, 2017
Visiting Scientist, Max Planck Institut für Festkörperforschung, Stuttgart, July, 2009-2015, Aug-Oct. 2016
Visiting Scientist, Fritz Haber Institut der MPG, Berlin, Summer 1998-2007; Spring 2001
Visiting University Professor, Helsinki University of Technology, Finland, Aug. 2000 – Jan. 2001
Adjunct Professor, National Center for Physics, Islamabad, Pakistan, 2004 – 2009
Visiting Scientist, Max Planck Institut für Strömungsforschung, Göttingen, June-July, 1997
Visiting Scientist, Freie Universität Berlin and Fritz Haber Institute, Berlin, July-August, 1996
Professor Invité, Ecole Polytechnique Federal de Lausanne, Lausanne, Switzerland, June-August 1993
Visiting Physicist, Brookhaven National Laboratory, Sept. 1992-May 1993
Visiting Scientist, Sandia Laboratories, Livermore, July-Sept. 1992
Guest Scientist, Forschungszentrum, Jülich, July 1991, Summer Months 1984-89
Faculty Research Participant, Argonne National Lab., May-August 1990; June-August 1995
Research Physicist, University of California, Irvine, May-August 1983

SELECTED FELLOWSHIPS, AWARDS, & HONORS

1987 Alexander von Humboldt Research Fellowship, FRG, 1987-88
1992 Stamey Undergraduate Teaching Award, Kansas State University
1993 CNRS-Italy Fellowship
1994 UNDP-TOKTEN Fellowship, Quaid-e-Azam University, Islamabad, Pakistan
1998 Fellow, American Physical Society
1998 Distinguished Graduate Faculty Award, Kansas State University
2000 Alexander von Humboldt Research Prize
2002 Higuchi Research Achievement Award (Olin K. Petefish Prize), University of Kansas
2003 Phi Beta Kappa, Honorary Member, Beta Chapter, KSU
2004 Sigma-Xi Distinguished Lecturer (2004-2006)
2007 Sigma Pi Sigma Member, Honorary Member, UCF
2011 Research Incentive Award, University of Central Florida
2011 University of Central Florida - ORC Millionaires Club, 2011-12

- 2012 University of Central Florida - ORC Millionaires Club, 2012-13
- 2016 Fellow, American Vacuum Society (AVS)
- 2016 Miller Visiting Professorship, University of California, Berkeley
- 2016 Editorial Board Member, Progress in Surface Science
- 2016 Physical Sciences Advisory Board, Oak Ridge National Laboratory
- 2016 Miller Visiting Research Professor, University of California, Berkeley
- 2016 Chair, Davisson and Germer Prize Committee, American Physical Society

SCIENTIFIC PRODUCTIVITY

Publications: over 250 in refereed high impact journals (full list available). *Citations:* 6836; *h-index:* 46
<https://scholar.google.com/citations?user=tel1v6oAAAAJ&hl=en&oi=ao>

Invited Presentations: on average about 12 – 20 invited talks per year.

LANGUAGES SPOKEN

Fluent in English, Urdu, Hindi and Bengali; comfortable in German, broken in French.

PRINCIPAL RESEARCH TOPICS

- Multi-scale modeling of chemical reactions and related phenomena at surfaces
- Understanding processes that control growth and morphological evolution of thin films
- Theory and modeling of vibrational, optical and magnetic properties of nanomaterials
- Predictive modeling of functional two-dimensional transition metal dichalcogenides
- Surface coordination chemistry: novel functionality via substrate charge transfer and oxidation state
- Understanding the response of surfaces and nanostructures to ultrafast external fields
- Development of techniques beyond density functional theory for strongly correlated material
- Development of techniques suitable for non-equilibrium phenomena and non-adiabatic processes

MEMBERSHIPS

- APS (American Physical Society)
- ACS (American Chemical Society)
- AVS (American Vacuum Society)
- AAPT (American Association of Physics Teachers)
- AAAS (American Association for the Advancement of Science)
- MRS (Materials Research Society)
- PhysTEC (Physics Teachers Education Coalition): aimed at increasing number of physics teachers)
- APS Bridge Program (aimed at increasing number of physics PhDs from underrepresented groups)
- National Mentoring Community established 2015 by American Physical Society

CURRENT FUNDED PROJECTS

- NSF: CHE-1310327 “*Surface Coordination Chemistry: Toward Novel Functionality*” (2013-17)
- NSF: INT-1134698 “*US-Pakistan Workshop: International Nathiagali Summer College*” (2011-2017)
- NSF: CHE-1465105 “*SusChEM Defect-laden 2D Catalysts for Carbon Sequestration and Safer Hydrogenation*” (2015-2018)
- NSF: DUE-1246024 “*Active Learning Strategies for Algebra-based Introductory Physics Courses at UCF*” (2013-17)
- DOE: DE-FG02-07ER15842 “*Controlling Structural, Electronic, and Energy Flow Dynamics of Catalytic Processes through Tailored Nanostructures*” (2003 - present)

- DOE: DE-FG02-07ER46354 “*Theoretical and Computational Studies of Functional Nanoalloys and other Nanomaterials*” (1993 - present)
- APS Site Grant: “UCF PhysTEC Comprehensive Site,” (2013-2016); locally sustained till 2019.
- APS Site Grant: “UCF APS-Bridge Program Site” (2015-2018); locally sustained till 2021.

EXTERNAL RESEARCH FUNDING at UCF (2007-2016): \$7,235,725 (NSF, DOE & APS)

GRADUATE STUDENTS SUPERVISED

Jin He, Ph.D., 1987	Duy Tran The Le, PhD, 2012
Liqui Yang, Ph.D., 1991	Maral Aminpour, PhD, 2013
Kai Yang, Ph.D., 1991	Syed Islamuddin, PhD, 2013
Wes Bailey, Masters, 1995	Neha Nayyar, PhD, 2014
Pavlin Staikov, Ph.D., 1998	Alamgir Kabir, PhD, 2015
Sondan Durukanolgu, Ph.D., 1999	Ghazal Shafai, PhD, 2016
Ahlam Al-Rawi, Ph.D., 2000	Jarrad Pond, PhD 2016
Weibin Fei, Ph.D., 2000	Takat Rawal, PhD in progress
Chandana Ghosh, PhD, 2003	Shree-Ram Acharya, PhD in progress
Sampyo Hong, PhD, 2005	Zahra Hooshmand, PhD in progress
Faisal Mehmood, PhD, 2006	Nasim Uddin, PhD in progress
Altaf Karim, PhD, 2006	Tao Jiang, PhD pre-candidacy
Marisol Alcantar Ortegoza, PhD, 2007	Riffat Munir, pre-candidacy
Handan Yildirim, PhD, 2010	Mahboob ur Rehman, pre-candidacy

POST-DOCTORAL ADVISEES AND RESEACH ASSOCIATES

Dr. Sergey Stolbov, 2000 - 2007	Dr. Chandana Ghosh, 2008- 2011
Dr. Zengju Tian, 1993	Dr. Volodymyr Turkowski, 2008 – present
Dr. Abdelkader Kara, 1994 – 2007	Dr. Marisol Alacantara Ortegoza, 2008 – 2012
Dr. Ulrike Kürpick, 1995-98	Dr. Giridhar Nandipati, 2009 – 2012
Dr. Ahlam Al-Rawi, 2003- 2009	Dr. Sampyo Hong, 2005 – 2014
Dr. Vasse Chis, 2009 – 2010	Dr. Duy Le, 2012 – present;
Dr. Alfredo Ramirez, 2012 – 2014	Dr. Jacquelyn Chini, 2010 - 2013

PROFESSIONAL INTERNATIONAL CONTRIBUTIONS (2005- 2016): selected examples

- Organized condensed matter physics program at the annual International Nathiagali Summer College (INSC), Pakistan (established by Nobel Laureate Abdus Salam) and partially funded by NSF, 1998-2010.
- Through INSCs and follow-up work-shops and scientific visits, helped establish/strengthen several prominent research groups in Pakistan, most requiring negotiations with government officials.
- Serving as consultant to the Coordinator General (Dr. Shaukat Hameed) of COMSTECH, the Ministerial Standing Committee on Scientific and Technological Cooperation of the Organization of Islamic Cooperation, 2014 - .
- One of three experts invited to advise University of Gothenburg, Sweden, on the establishment of a Marine Sciences Department, October 2014.
- Member, International Organizing Committees (e.g. International Conference on Solid Films and Surfaces 2012-present; European Conference on Surface Science, 2008- 2011).
- Guest Editor, Special Issue “van der Waals Bonding in Advanced Materials,” Journal of Physics: Condensed Matter, Volume 24, July 2012.
- Member, Board of International Advisors, GIK Institute of Technology, Topi, Pakistan, 2004-
- Scientific Advisory Board, Lahore University of Management Sciences, Pakistan, 2008–present.
- Panel Reviewer for Villanova Research Foundation, Sweden, for selection of Centers of Excellence in Materials, 2009.

- Vice Chair, Scientific Review Panel for Physics and Mathematics, Lund University, 2007- 2008.
- Chair, Scientific Review Panel for Physics & Mathematics, University of Gothenburg, 2010-2011.
- Member, International Evaluation Committee for Condensed Matter Physics, Swedish Research Council, 2004 - 2005.
- One of two experts in the hiring committee for a faculty position in Theoretical Chemical Physics, Stockholm University, Sweden, 2008
- Adjunct Professor, National Center for Physics, Islamabad, Pakistan, 2005 –
- Member, Editorial Executive Board, Journal of Physics: Condensed Matter, IOP, 2009 – present.
- Member, Editorial Board, Journal of Theoretical and Computational Nanoscience, 2003 – 2006.
- Member, Editorial Advisory Board, Journal of Physics: Condensed Matter, IOP, 2006 – 2009
- Organized a number of international conferences and workshop (e.g. 13th International Conference on Vibrations at Surfaces, Orlando, Florida, March 10-13, 2010).
- Guest Editor, Special Issue “Computational Techniques for Designing Materials,” Journal of Physics: Condensed Matter, Volume 21, No. 8, 2009

PROFESSIONAL SERVICE AT THE NATIONAL LEVEL (2005 -2016): selected examples

- Member, Physical Sciences Advisory Board, Oak Ridge National Laboratory, 2017-2020
- Vice-Chair/Chair, Davisson and Germer Prize Committee, American Physical Society, 2014-present
- Executive Committee Member, American Vacuum Society, Surface Science Division, 2014-2016.
- Program Chair, Focus Topic: Accelerating Materials Discovery for Global Competitiveness, 62nd AVS International Symposium & Exhibit, San Jose, October (2015).
- Program Committee Member, Focus Topic: Accelerating Materials Discovery for Global Competitiveness, 61st AVS International Symposium & Exhibit, Long Beach, October (2014).
- Vice Chair/Chair-Elect/Chair (2014-2016) APS Topical Group on Energy Research and Applications (GERA)
- Regular DOE-BES panel reviewer of proposals. Some recent panels: INCITE Material Science initiative; Computational Material Science Network; Energy Frontier Research Centers; Theory, Modeling and Simulation; DOE Office of Science Graduate Fellowship; DOE Catalysis Science Early Career.
- Invited participant, DOE-BES/ASCR Extreme Scale Workshop, 2009.
- Evaluation panel member for NSF funding initiatives such as NIRT, IGERT, MRI, CDI, MRSEC, DMREF
- Physics Department Program Reviewer: University of West Florida, 2009; University of North Carolina, Charlotte, 2015; University of Kansas, 2016.
- Member, Scientific Review Panel, BES Division, Oak Ridge National Laboratory, January 2006; Lawrence Berkeley National Laboratory, Materials Research Program, January 2012.
- Member, DOE Review Panel, SUNCAT Research Center, Stanford University/SLAC, April 2016.
- Member, DOE Review Panel, BES Division, Energy Frontier Research Center mid-term review, February 2016.
- Executive Committee, Division of Materials Physics, American Physical Society, 2002-2005.
- Member, APS site visit team for improving the climate for women in Physics departments, 2004-05.
- Scientific Advisor, NOVA science program, Public Broadcasting Service, 2006 –present.
- Member, Committee of Visitors, Division of Materials Research, National Science Foundation, 2008
- Nominating Committee Member, Forum on International Physics, 2009 -2011
- Co-organizer, Focused Session on "Computational Design of Novel Materials," APS March Meeting 2010, Portland.
- Co-organizer, Focused Session on "van der Waals Bonding in Advance Materials," APS March Meeting 2012, Boston.
- Co-organizer Focused Session on "Computational Nanoscience," APS March Meeting 2007, Los Angeles.

- Organizing Committee for Workshop “Atomistic and mesoscale modeling of materials defects”, Oct. 22-26, 2012, Los Angeles, Institute for Pure and Applied Mathematics (IPAM).

PROFESSIONAL CONTRIBUTIONS AIMED AT WOMEN & MINORITIES: selected examples

- As the first female physics faculty member at Kansas State University, helped create a female friendly environment, leading to increased numbers of female graduate students and faculty in the period 1984-2006.
- Served formally as faculty mentor at Kansas State University to several female faculty members, as part of a Sloan Foundation Grant (1993-1995). These faculty members are successful professionals.
- Worked with Committee on the Status of Women in Physics, American Physical Society, in its efforts to change the climate for women and minorities through Site visits.
- As President of Faculty Senate at Kansas State University, 1998-99, initiated a process for system-wide study of gender equity issues in all Kansas universities, endorsed by the Kansas Board of Regents. A large number of equity issues were resolved as a consequence.
- As chair of the Task Force on Enhancing Retention and Graduation Rates for Minority Students, 1999-2000, helped establish a program at Kansas State University (Developing Scholars), which continues to be successful at recruiting and retaining students from historically underrepresented groups.
- As KSU Presidential Lecturer 1990-1999, served as a frequent speaker at K-12 institutions in Kansas, with the aim of recruiting women and minorities to STEM disciplines.
- As a member of the Faculty Senate Executive Committee, KSU, 1991-92, 1997-2000, helped introduce policies regarding tenure-clock stoppage and maternity leave for better retention of female faculty members.
- As author of the article “Should we tell our daughters to become scientists?” CSWP Gazette, 24, 3 (2005), was invited to present Sigma Xi Distinguished Lecture on the subject at a number of US academic institutions.
- Following the conduction of a Survey of Career Satisfaction of Senior US Women Physicists, 2006 (in conjunction with Professor Kathy Levin, U. Chicago and Rachel Ivy, AIP), organized a NSF-ADVANCE Workshop: Women in Science and Engineering at KSU, February 15-16, 2008.
- Helped establish in 2012 Women in Physics Group (WPG) at UCF, which holds monthly networking events and arranges mentoring and outreach activities to recruit and retain young women in STEM disciplines.
- Together with WPG, facilitated holding of the 2013 South-eastern Conference for Undergraduate Women in Physics at UCF. About 120 women engaged in an exciting workshop with 18 successful female physicists.
- As chair of the UCF Physics Department (2006 – 2015), encouraged policies and programs that help create a female-friendly environment, as signified by a noticeable increase in the number of female students and faculty members; initiated a lactation room in the new Physical Sciences building.
- As site leader of the APS Bridge Program grant (3 year APS + 3 year UCF commitment), engaged in establishing policies and procedures that help recruit and retain physics graduate students from underrepresented minority (URM) groups. Twelve students admitted 2014-16. At least 4 to be admitted per year for the next five years.
- Invited to Virginia Tech University, May 3-5, 2016, to advise faculty and administrators on strategies that help recruit and retain URM students.

PROFESSIONAL CONTRIBUTIONS AIMED AT REFORMING STEM EDUCATION

- As the PI of the APS PhysTEC Comprehensive Site grant, 2013 – present, engaged in recruitment and training of physics majors as future science teachers to address the shortage of teachers with sound content knowledge. In this regard also helped establish a teacher-in-residence program which in turn strengthened the interaction with local high school teachers.

- In 2011, I helped establish a successful Learning Assistant (LA) program in the Physics Department at UCF, based on the University of Boulder model, which emphasizes peer-instruction through pedagogical training of the undergraduates who serve as LAs.
- I am leading NSF-supported pedagogy reform in introductory physics courses via active learning environment (studio) and inquiry-based methodology. I have also facilitated such reforms in upper-division physics courses.
- Member PhysTEC Site visit team, Georgia State University, Atlanta, April 3, 2014
- Member PhysTEC Site visit team, University of Alabama, March 23, 2015