

Prof. Dr. Iman Novruz oglu Askerzade



Iman Askerzade was born on 12 March 1962 in Agcabedi district of Azerbaijan. He graduated from Physical Faculty of Moscow State University in 1986. He joined the Laboratory of Cryoelectronics of the same Faculty as a probationer-researcher for the period 1987-1989 for the study of dynamical properties of Josephson balanced comparators. Since 1993 up to now he works in the Institute of Physics of the Azerbaijan National Academy of Sciences. He received the Ph.D. on the theory of electron-phonon based superconductivity in layered systems in 1995 year. His Dr.Sc. thesis was defended by Iman Askerzade in 2005 year, which related with the theoretical study of superconductivity in anisotropic many-band compounds and dynamical properties of some structures in these bases. Since 2012 year he is the Professor and Head of Department of Computer Engineering of Ankara University, Turkey.

In 2000 years he visited the Institute of Solid State Physics, Dresden, Germany as DAAD fellowship for three months. For the period 8/2000-6/2001 TUBITAK (Turkey Research Council) postdoc grants Iman Askerzade joined firstly to Bilkent University, Physics Department and for the period 11/2002-12/2002 to Ankara University, Physics Department. For the time period 07/2004-07/2007 he got reintegration grant in the Azerbaijan National Academy of Sciences, Institute of Physics. For the 2004-2011 years Iman Askerzade was elected as Associate Member of Abdus Salam International Center for Theoretical Physics, Trieste, Italy.

Main scientific interests of Prof. Dr. Iman Askerzade are focused on new classes of many-band and anisotropic superconductors, such as MgB_2 , borocarbides and FeAs based compounds. In addition, his research deals with the dynamics of Josephson junction systems based novel superconductors. Prof. Dr. Iman Askerzade is an author of pioneering research, where the intergradient interaction term between order parameters into Ginzburg-Landau free energy functional taking into account 'drag' effects was introduced for the first time. Later, this result was applied to new compounds with many-band superconducting state. Inclusion of this term led to interesting physical properties, such as frustration effects in many-band superconductors and different topological formations. The above studies by Iman Askerzade are cited in a book of V.L. Ginzburg 'Superfluidity and Superconductivity', Springer (2009).

Furthermore, using generalized Eliashberg theory for anisotropic and many-band superconductors he did the analysis of the non-adiabatic effects on critical temperature with different phonon transfer momenta. The influence of Coulomb interaction on critical temperature with arbitrary thickness of layers and plasmon spectrum is calculated. In framework of BCS (Bardeen-Cooper-Schrieffer) theory it was investigated specific heat jump at critical temperature and estimated order parameter anisotropy of anisotropic and multiband superconductors. The graphene single-layer superconductor and corresponding plasmon spectrum are studied on the basis of the obtained results. Critical temperature of Bose-Einstein condensation in cubic bosonic gas is calculated and thermodynamical properties detailly analyzed.

Another main contribution of Prof. Dr. Iman Askerzade related with study of characteristics of Josephson circuits and quantum bits on these base. He investigate the dynamics of Josephson balanced comparators fed by Single Flux Quantum. Firstly offered linear theory of time resolution of Josephson balanced comparators and it was shown resolution at the level 1 ps. Also it was theoretically calculated characteristics of YBaCuO based superconducting bolometers. He also investigate chaotic dynamics of some Josephson circuits. Last years Prof. Dr. Iman Askerzade investigate I-V curve of Josephson junction with current-phase relation including additional anharmonic and fractional term. The influence of this term in current-phase relation on plasma frequency of junctions is calculated. Effect of anharmonic in current-phase relation on energy spectrum is numerically calculated in phase, flux and charge qubits using Hamilton formalism. It was shown the importance of the control circuit parameters on the qubit characteristics. Last years he extent research interests to the fuzzy logic applications and deep learning methods.

Prof. Dr. Iman Askerzade is an author of 132 SCI papers including four review articles (two papers in Physics Uspekhi), two international monographs (Springer, 2012 and 2017), one National textbook on superconductivity and its applications (2005) and eighty nonSCI papers. He participated in more than 50 International Conferences with plenary and oral presentations. He was consultant of one Dr. Sci. thesis, supervised five Ph. D. theses and twenty Ms. sc. theses. He was the Principal Investigator in 10 research Projects (among them five are international projects). Also, he is a Vice-President of Turkish National Center of Superconductivity (2009) and a member Member of European Society of Applied Superconductivity (1999). He is a member of Editorial Board of journals: Advanced Physical Research (Azerbaijan), Ankara University Communications A2-A3 (Türkiye, Ankara), Proceedings of Institute of Applied Mathematics (Azerbaijan), Superconductivity: Fundamental and Applied Research (Moscow, Russia).