Herbert Gleiter received his Ph.D. in Physics and between 1966 and 1971 he joined Harvard University, MIT and Bell Laboratories. In 1973 he moved as a Director of the Institute of Materials Science to the University of Saarbuecken and founded there the Institute of New Materials. In 1994 he was appointed President of the Research Center of Karlsruhe (today's Karlsruhe Institute of Technology, KIT). In this function, he set up the Institute of Nanotechnology (INT). Since 2012 he is also the Director of the "Herbert Gleiter Institute of Nanoscience" at the Nanjing University. In addition, the Chinese Academy of Sciences has recently founded the Herbert Gleiter International Laboratory (HGIL) which will focus on studies of nano-glasses. During his career he received more than forty prizes and awards, six Honorary Doctor Degrees and several Honorary Professorships. He is an elected member of 12 National Academies of Science and/or Engineering.

In the late 70's – based on the new understanding of the atomi structures of grain boundaries in metals developed by his research group (structural unit model) he initiated a new kind of materials, called today nano-crystalline materials and more recently, the new field of nanoglasses that seem to represent a new kind of dense non-crystalline solids.