

The 2017 Fritz London Memorial Prize Winners

William P. Halperin, (Northwestern University, USA)

<http://spindry.phys.northwestern.edu>



Citation:

“The Fritz London Memorial Prize is awarded to William P. Halperin in recognition of his pioneering work on the influence of disorder on the superfluidity of Helium 3.”

William (Bill) Halperin, received his Bachelor’s degree in Mathematics at Queen’s University in Kingston, Ontario in 1967, Master’s degree in Physics at the University of Toronto in 1968, and Ph.D. from Cornell University in 1975. In 1975 he was appointed Assistant Professor of Physics and Astronomy at Northwestern University and Professor in 1986, John Evans Professor of Physics (2001), and Orrington Lunt Professor of Physics (2015). He was chair of the Department of Physics

and Astronomy at Northwestern (1990-1996) and director of the Integrated Science Program (1998-2003). Bill was an Alfred P. Sloan Fellow (1977-81), fellow of the American Physical Society (1995), and fellow of the Institute of Physics (2004), chair of the external advisory committee of the National High Magnetic Field Laboratory (2004-2014), chair of the Division of Condensed Matter Physics of the American Physical Society (2014-2018), chair of the C5 Commission for Low Temperature Physics of the International Union of Pure and Applied Physics (2017-2021). As a proponent of helium conservation, he testified in Congress in 2010 and in 2015. During his graduate studies he discovered spontaneous nuclear magnetic ordering in solid ^3He , measuring its change in entropy at a first-order thermodynamic transition near 1 mK. This was the first observation of nuclear magnetic order. With his advisor Bob Richardson, they reached unprecedented low temperatures in ^3He of 800 μK .

At Northwestern, with his student David Mast and colleagues, they found a new collective mode of the ^3He -B superfluid order parameter, a $J = 2$ Higgs excitation. With graduate student Yoonseok Lee, they demonstrated propagating transverse sound and acoustic Faraday rotation in superfluid ^3He -B, the only fluid known to support propagating transverse sound. The highest quality crystals of the unconventional superconductor UPt_3 have been grown by Bill's students. In collaboration with Dale van Harlingen and Aharon Kapitulnik and Morten Eskildsen, they have shown that this compound is a topological superconductor that breaks time-reversal symmetry and exhibits chiral symmetry in one of its three vortex phases. Observation of new ^3He superfluid phases in silica aerogel by Bill's research group led to the 2017 Fritz London Memorial Prize, awarded jointly with Jeevak Parpia and Jim Sauls.