

## DYNES, HOHENBERG AND LARKIN RECEIVE LONDON PRIZE

Robert C. Dynes and Pierre C. Hohenberg, both of AT&T Bell Laboratories, and Anatoly I. Larkin of the Landau Institute for Theoretical Physics in Moscow, shared this year's Fritz London Prize for Low-Temperature Physics. The prize was scheduled to be presented on 16 August, at the 19th International Conference on Low-Temperature Physics in Brighton, England.

Dynes is cited for "broad contributions to low-temperature physics."

From 1967 to 1975 Dynes did both theoretical and experimental studies of the electron-phonon interaction in traditional superconductors, and he currently studies strong coupling of electrons and phonons as a possible mechanism for superconductivity in high- $T_c$  materials. In 1971 Dynes began using superconducting tunnel junctions to detect phonons in solids and in liquid helium by measuring the local change in Cooper-pair density caused by the phonons. Most recently he observed transport and tunneling in two-dimensional metals, thus confirming weak localization in a two-dimensional system.

Dynes joined Bell Labs in 1968, soon after receiving his PhD in physics from McMaster University in Hamilton, Ontario, Canada. Since 1983 he has been director of the

chemical physics research laboratory at Bell Laboratories.

Hohenberg was selected for his "seminal theoretical contributions to the physics of superfluidity, of critical phenomena, and of instabilities in pattern-forming hydrodynamic systems," and for his "strong positive influence on the direction and interpretation of experimental research in these fields."

In 1967, in collaboration with Bertrand I. Halperin, Hohenberg developed a phenomenological scaling theory for dynamics near critical points, generalizing the so-called static scaling laws of Benjamin Widom, Leo Kadanoff and others, and the analysis of the dynamical behavior of  $He^4$  at the lambda point by Richard Ferrell, Nora Menyhard, Hartwig Schmidt, F. Schwabl and Peter Szepfalussy. In the early 1970s Hohenberg and his collaborators formulated the renormalization group for dynamics, confirming the earlier phenomenological results. More recently Hohenberg has turned his attention to spatial pattern formation and the dynamics of fluid flow.

Hohenberg earned his PhD in physics from Harvard University in 1962, and since 1964 has been at Bell Labs, where he is a distinguished member of the technical staff.

Larkin's citation highlights his

"contributions to the theory of thermal and quantum fluctuations at low temperatures, including his work on fluctuations in superconductors, on flux-lattice and charge pinning, on weak localization, and on quantum tunneling." His work on phase transitions in dipolar systems, the citation goes on, "pioneered the use of the renormalization group for calculation of critical exponents."

In 1968, working with L. Aslamasov, Larkin predicted "paraconductivity," the decrease in resistivity of superconducting metals at temperatures slightly above the critical temperature. In a 1969 collaboration with D. Khmel'nitskii, he calculated the precise form of the diverging specific heat at a transition dominated by dipolar interactions by introducing renormalization-group techniques into the theory of critical phenomena. In 1973 Larkin and Yu. Ovchinnikov found that it is the collective interaction between flux vortices and weak defects that allows superconductors to have a nonzero critical current.

Larkin earned his PhD in physics in 1960 from the Kurchatov Institute of Atomic Energy. Since 1966 he has been head of the quantum-mechanics department at the Landau Institute for Theoretical Physics.

—MATT SIEGEL

Anatoly I. Larkin



Pierre C. Hohenberg



Robert C. Dynes

