

## Biographical Information

Barry C. Barish

Dr. Barish earned a BA in 1957 and Ph.D. in 1963 in physics from the University of California, Berkeley. Among his noteworthy research accomplishments were experiments using high-energy neutrinos at Fermilab that revealed the quark substructure of the nucleon. These experiments were among the first to observe the weak neutral current, a linchpin in the Electroweak Unification theory of Glashow, Salam, and Weinberg. Barish is presently the Director of the Global Design Effort for the International Linear Collider, the highly challenging worldwide effort to design and build the most ambitious particle accelerator every undertaken.

Barish is a Linde Professor of Physics, Emeritus at the California Institute of Technology, where he has taught and conducted research since 1963. In October 2002, he was nominated to the National Science Board; a 24-member board that oversees the National Science Foundation (NSF) and advises the President and the Congress on policy issues related to science, engineering, and education.

Highlights of Barish's career include a sophisticated underground experiment (MACRO) to search for the long sought magnetic monopole, the magnetic analog of the single electric charge. The experiment was conducted deep underground in the Gran Sasso tunnel in Italy and it yielded the most sensitive limits on the density of Grand Unified magnetic monopoles in the Universe. In addition, it provided key evidence that neutrinos have mass, perhaps the most important discovery in particle physics in the last decade.

Dr. Barish has served as the PI and Director of the Laser Interferometer Gravitational-wave Observatory (LIGO) for most of the last decade. LIGO's goal is to make the first direct detections of gravitational waves. Gravitational waves were first predicted by Albert Einstein in his General Theory of Relativity in 1916, but still await detection. The 4-kilometer LIGO interferometers, located in rural Louisiana and Washington State, are designed to detect tiny ripples in space-time far smaller than the size of a proton, coming from distant sources such as colliding black holes. LIGO is in the midst of a long data run that could well yield detections, and the project is approved for funding for a major upgrade that will make detections a near certainty..

Dr. Barish has served on many advisory panels, and notably was co-chair of a sub panel of the High Energy Physics Advisory Panel (HEPAP) that developed the long-range plan for U.S. high-energy physics in 2001. He also chaired the international committee that chose the basic technology (superconducting RF) for the International Linear Collider (ILC), and chaired an NRC panel that produced the important NAS report, "Neutrinos and Beyond." In 2003, he was a member of the special panel for NASA that considered the future of the Hubble Space Telescope and the transition to the James Webb Space Telescope.

In 2002 Dr Barish received the Klopsteg Award from the American Association of Physics Teachers and was elected to the National Academy of Sciences. In 2006, he received an honorary doctorate from the University of Bologna and in 2007 delivered the Van Vleck lectures at the University of Minnesota.

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