PHYSICS&ASTRONOMY
THE UNIVERSITY OF TEXAS AT SAN ANTONIO

Professor Jacob Bekenstein

Hebrew University of Jerusalem
Racah Institute of Physics
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John Peace Library Assembly Room
10:00 AM

"Black Holes and the Limits of Information"

Our civilization depends on accessible information; so much effort is expended to improve the speed of information transfer and the capacity of information storage. Perceived limits to either often depend on limitations of the technology employed, or the kind of physics being harnessed. But there are actually absolute limits to information capacity; these were first disclosed by black hole thermodynamics. I will give an introduction to the way information is quantified as well as to black hole physics. I will then explain why black hole thermodynamics was needed and how it was actually constructed. I will then explain the origin of the holographic information bound, the most notorious of all such bounds, and then pass on to the holographic principle which is currently having strong repercussions both on high energy and condensed matter physics.

Jacob Bekenstein was born Mexico City in 1947. He obtained his undergraduate and M.Sc. degrees in 1969 from the Polytechnic Institute of Brooklyn/New York University, and his Ph. D. from Princeton University in 1972 under the direction of John A. Wheeler with postdoctoral work at the University of Texas at Austin. Since 1990 he has been at the Hebrew University of Jerusalem (since 1993 as Polak Professor of Theoretical Physics). His scientific interests have included gravitational theory in general, black hole physics (including black hole thermodynamics which started with his work), relativistic magnetohydrodynamics, galactic dynamics, and the physical aspects of information theory. Currently he is interested in ideas for realistic experiments to explore quantum gravity and in the role of space-time fluctuations in resolving various black hole paradoxes. Bekenstein has been a member of the Israel Academy of Sciences and Humanities since 1997, and has been honored with the Bergmann Prize, the Landau Prize, the Rothschild Prize, the 2005 Israel Prize, the Weizmann Prize, the 2012 Wolf Prize, and Einstein Prize of the American Physical Society for 2015.

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