



You are cordially invited to attend the Solvay colloquium entitled

« STRINGS, GAUGE THEORY AND INTEGRABILITY: WHAT OLD IDEAS FROM CONDENSED MATTER ARE TEACHING US ABOUT FUNDAMENTAL PHYSICS »

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Abstract

" String theory has redefined itself several times since its invention forty years ago. A recent chapter in this saga is the proposal that string theory in ten dimensions is dual to a supersymmetric gauge theory in four dimensions. In its weak form, duality implies that the strong coupling behavior of the gauge theory should be identical to that of a weakly-coupled gravity theory (in a different dimension), a surprising assertion which has received numerous qualitative checks. In its strong form, duality says that the two theories should be identical, something which, in the absence of exact solutions for either theory, is hard to verify. In a dramatic recent development, duality has been traced to the presence, in both theories, of an underlying integrable one-dimensional spin chain, of a type familiar from condensed matter physics. Integrability allows exact solutions to be constructed, (using techniques invented by Bethe in the 1930's!) and this has opened up the possibility of directly verifying the strong form of duality. The first results of exploiting these new ideas are most impressive and my goal in this talk is to convey to a general physics audience some idea of what has been achieved. While I will have to gloss over technical details, I hope to be able to communicate a clear sense of why these new developments are of great conceptual, and maybe even practical, importance. "

Tuesday May 8, 2007 at 16h00

COFFEE AND TEA WILL BE SERVED AT 15H45 IN FRONT OF THE SOLVAY ROOM

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