

The screenshot shows the Guinness World Records website interface. At the top left is the Guinness World Records logo. A navigation bar contains categories: HUMAN BODY, AMAZING FEATS, NATURAL WORLD, SCIENCE & TECH, ARTS & MEDIA, HISTORY & SOCIETY, TRAVEL & TRANSPORT, and SPORTS & GAMES. The main content area is titled 'SCIENCE AND TECHNOLOGY << AMAZING SCIENCE << LOWEST TEMPERATURE'. The record title is 'Lowest Manmade Temperature'. The 'WHO:' field lists 'Aaron Leanhardt & team'. The 'WHEN:' field lists 'Results published Sept 12, 2003'. The 'WHERE:' field lists 'MIT, Massachusetts, USA'. The 'WHAT:' field lists '450 picokelvin above zero K'. A 'Send to a friend' button is visible. On the right side, a list of other records includes 'MOST TELEPHONES PER HEAD', 'HIGHEST MAN-MADE TEMPERATURE', 'MOST ACCURATE VALUE OF PI', 'MOST PROLIFIC MATHEMATICIAN', 'LARGEST SCIENTIFIC INSTRUMENT', 'FINEST BALANCE', and 'MOST DUCTILE ELEMENT'. At the bottom right, there is an image of the 'Guinness World Records 2004' book with a 'NEW' badge. The footer contains links for 'PRIVACY', 'CREDITS', and 'CORPORATE'.

Lowest Manmade Temperature

The lowest manmade temperature achieved so far is 450 picokelvin. It was achieved by a team of scientists at the Massachusetts Institute of Technology in Cambridge, Massachusetts, USA: A.E. Leanhardt, T.A. Pasquini, M. Saba, A. Schirotzek, Y. Shin, D. Kielpinski, D.E. Pritchard and W. Ketterle. The results were published in *Science* magazine on September 12, 2003.

This remarkable temperature – which beats the previous record by a factor of six – is the latest achievement in the quest to reach absolute zero, or zero Kelvin, the lowest temperature possible. At such low temperatures, which are just a few billionths of a degree, matter takes on a new state called a Bose-Einstein condensate (the discovery of which earned Wolfgang Ketterle a share in the 2001 Nobel Prize for Physics). In this state, atoms behave as one

"superatom". Scientists can then use magnetic fields to isolate and cool the atoms further. Leanhardt and his team achieved the lowest temperature yet by using a "gravito-magnetic trap", which holds the isolated atoms more lightly than the magnetic fields used to date. In theory, even lower temperatures should be possible using the same technique.