

Spring fever

Perhaps it is just the onset of spring, but I am feeling optimistic.

The team behind the WMAP Cosmic Microwave Background satellite has just released its third-year data, which remain strikingly consistent with many of the canonical predictions of inflationary theories (despite some puzzling features at large angular scales).

Next year, the new Large Hadron Collider at CERN will be turned on. We have been waiting over 20 years for an accelerator capable of definitively addressing physics beyond the standard model, thanks to the tragically stupid cancellation of the Superconducting Supercollider project in the United States — which would otherwise by now have been running for almost a decade.

And in the last year, the Laser Interferometer Gravitational-Wave Observatory (LIGO) has reached its design sensitivity, something many in the community thought unachievable. Although LIGO-1 is unlikely to detect gravitational waves from astrophysical sources, engineering lessons of the past decade enabled improvements through Advanced LIGO and ultimately to space-based interferometers. These might reveal precise information not only on the final stages of black-hole collapse, but on the expansion history of the Universe.

We are not guaranteed any revolutionary discoveries, but if history is any guide, every time we open new windows on the Universe we tend to be surprised. Even null experiments, such as that performed



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almost 120 years ago by Albert Michelson and Edward Morley, can be profoundly important.

This will be especially important to remember if the LHC reveals nothing new. Although it may make funding the proposed International Linear Collider more difficult, whether we observe the standard-model Higgs, or don't observe the Higgs at all, this will dramatically alter the theoretical playing field of fundamental physics. Notions such as low-energy supersymmetry — perhaps the most well-motivated, untested theory on the market — may need to be revised or discarded.

One way or another, a long winter's darkness may soon be coming to an end.

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