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The Three-Legged Stool

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Astrophysical observations provide overwhelming evidence that the current structure of the universe is not due to ordinary gravity acting on ordinary baryons. How can we learn more about the component particles of the physical world, and about the structure and origin of the cosmos? Think of a three-legged stool. For more than a century, physicists have made progress along these lines by colliding particles at ever-higher energies, and drawing inferences from the scattering processes. But the next generation of energy increase is separated from the present day by a minimum of 2×10^1 years and 2×10^{10} dollars. The second leg of the stool is even older: weve learned much about the cosmos through ever-improved telescopes (now no longer limited to detecting photons!) and weve come to understand that looking further out means looking further back. This approach still holds much promise, but I believe that looking forward, the third leg of the stool, precision measurement, will be increasingly important. Members of DAMOP have much to offer, here! I will give a very incomplete survey of activity in this area, and discuss some activities along this line ongoing at JILA.