

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

The Ideas of Particle Physics : four decades past and the next

JAMES DODD, Dr. James E Dodd, St Cross College, University of Oxford, OX1 3LZ — Over the last four decades, many outstanding questions in particle physics have been answered, but our increasingly sophisticated level of understanding has led to even deeper questions. The recently confirmed phenomenon of neutrino oscillations (and so neutrino mass) is definitely beyond its scope. In addition, cosmological observations now indicate that as much as 96 percent of the Universe is made up of unknown sources of ‘dark matter’ and ‘dark energy’. On the theoretical side, yet another string revolution has resulted in a new understanding of string theories as the limit of ‘M-theory’, but whose exact structure is not yet known, leaving a possible quantum theory of gravity as elusive as ever. This talk presents the story of the Ideas of Particle Physics from its origins mid-last century, and outlines the challenges ahead for the next.

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Date submitted: 09 Jan 2020

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