Terry Sloan, PhD, Physics
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Education

BSc, Honours Physics, Liverpool University, 1958
PhD, Physics, Liverpool University,1962 for a ``Measurement of the Neutron-Neutron Scattering Length", using pions stopped in deuterium.

Main Research Contributions

My research career has focused on experimental particle physics studying the structure of the nucleon with experiments in deep inelastic electron and muon scattering. These experiments also provided much of the experimental evidence on which quantum chromodynamics (QCD) has been built. At a time when the gluon was only a theoretical postulate, I discovered that photon-gluon fusion was the mechanism which governed the production of heavy quarks in deep inelastic scattering. The result confirmed that the gluon should exist and set QCD onto a firmer footing. In addition, I led the team which discovered that only a small fraction of the spin of the proton is carried by its valence quarks when the proton is probed at very small distances. This led to new generations of experiments to elucidate the details of the discovery and to new theoretical research to understand the result.

1989-94: ALEPH Collaboration at CERN measuring the branching ratio for the decay b to s plus gamma.

1994-2007: H1 collaboration at DESY to study further the structure of the proton.

2005-2011: Focus on cosmic rays. Firstly on the acoustic detection of Ultra High Energy neutrinos and more recently on trying to corroborate the hypothesis that cosmic rays are connected to the formation of clouds. This hypothesis is used by some as an alternative explanation to increasing greenhouse gases for global warming; however, we could not find evidence to corroborate the hypothesis. This work was reported on the national news in April 2008 and the work was presented to a meeting at the Department of Energy and Climate Change in March 2011. This work, together with that from other groups, was used by the Intergovernmental Panel on Climate Change (IPCC) to conclude that there is no robust connection between cosmic rays and global warming.

2011-present: T2K experiment in Japan on a study of neutrino oscillations; Group search for magnetic monopoles, published at https://inspirehep.net/?ln=en; Lecture course on “The Physics of Global Warming”, currently being summarized in a book; and E-book “Introductory Climate Science, global warming explained ” with free download at http://bookboon.com/en/introductory-climate-science-ebook

2016- present: MQN Collaboration researching Magnetized Quark Nugget candidate for dark matter.

Affliliations

University of Pennsylvania, Philadelphia, USA. 1963-1966 Research Investigator.

University of Lancaster 1966-1969 Research Associate

University of Lancaster 1969-1983 Lecturer in Physics.

University of Lancaster 1983-1990 Reader in Physics.

University of Lancaster 1990-2000 Professor of Physics.

University of Lancaster 2000 - present. Emeritus Professor of Physics

Scientific Associate at CERN 1983-1986

Spokesperson and leader of the European Muon Collaboration (EMC) 1983-1989.

Member of the PPESP (Particle Physics Experiments Selection Panel, Peer review body for funding of projects in Particle Physics) 1985-1988

Chairman of the PPESP 1989-1993

Member of the PPC (Particle Physics Committee. Policy making committee for particle physics) 1989-1993

1992 Awarded (jointly with E Gabathuler) the Rutherford Medal and Prize of the Institute of Physics for leadership of the EMC.

Head of the Particle Physics Group at the University of Lancaster 1991-2000.

1994 Chairman of the Review Panel of the administrative services provided for Particle Physics at the Rutherford Lab.

1996-1999 External Examiner for the Masters Degrees in physics at
Royal Holloway University of London.

2000-2003 External examiner for the undergraduate physics degrees at
Liverpool University.

1999-2002, Member of the H1 Executive Committee, DESY, Hamburg.

2003-2009, Member of the Boulby Science Group.

1990-2002 Member of various PPARC panels and committees eg
CERN fellowships Committee, Dark Matter panel, PPARC Fellowships
Committees etc.

List of Publications

The full list of 652 scientific publications which I have authored or co-authored, with details, can be found by issuing the command ``find a sloan,t" at
https://inspirehep.net/?ln=en

Magnetized Quark Nugget Publications

VanDevender, J. P., Shoemaker, I., Sloan T., VanDevender, A. P. & Ulmen, B.A. Mass distribution of magnetized quark-nugget dark matter and comparison with requirements and direct measurements. *Sci Rep* **10,** 17903 (2020). https://www.nature.com/articles/s41598-020-74984-z.

VanDevender, J. Pace, VanDevender, Aaron P., Sloan, T., Swaim, Criss, Wilson, Peter, Schmitt, Robert. G., Zakirov, Rinat, Blum, Josh, Cross Sr, James L. and McGinley, Niall Detection of magnetized quark nuggets, a candidate for dark matter. *Sci. Rep*. **7,** 8758 (2017).
www.nature.com/articles/s41598-017-09087-3

Environmental publications

Testing the proposed link between cosmic rays and cloud cover
by T.Sloan and A.W. Wolfendale
Environmental Research Letters Volume 3 page 024001 (2008)

Solar activity and the mean global surface temperature
by A.D. Erlykin, T.Sloan and A.W. Wolfendale
Environmental Research Letters Volume 4 page 014006 (2009)

Correlations of clouds, cosmic rays and solar irradiation over the Earth.
by A.D. Erlykin, T. Sloan and A.W. Wolfendale
Journal of atmospheric and solar-terrestrial physics volume 72 pages 151-156 (2010)

The search for cosmic ray effects on clouds.
by A.D. Erlykin, T. Sloan and A.W. Wolfendale
Journal of atmospheric and solar-terrestrial physics volume 71, pages 955-958 (2009)

On the correlation between cosmic ray intensity and cloud cover.
by A.D. Erlykin, G. Gyalai, K. Kudela, T. Sloan and A.W. Wolfendale
Journal of atmospheric and solar-terrestrial physics volume 71 pages 1794-1806 (2009)

Clouds, solar irradiance and mean surface temperature over the last century.
by A.D. Erlykin, T. Sloan and A.W. Wolfendale
Journal of atmospheric and solar-terrestrial physics volume 72 pages 425-434 (2010)

Some aspects of ionization and the cloud cover, cosmic ray correlation problem.
by A.D. Erlykin, G. Gyalai, K. Kudela, T. Sloan and A.W. Wolfendale
Journal of atmospheric and solar-terrestrial physics volume 71 pages 823-829 (2009)

Cosmic rays and global warming

by T. Sloan and A.W. Wolfendale.
Current Science volume 100 pages 1626-1629 (2011).

The contribution of cosmic rays to global warming,
by T. Sloan and A.W. Wolfendale.
Journal of atmospheric and solar-terrestrial physics volume 73, pp 2352-2355 (2011)

Ionization in the atmosphere, comparison between measurement and simulations by T. Sloan, G.A. Bazilevskaya, V.S. Makhmutov, Y.I. Stozhkov, A.K. Svirzhevskaya and N.S. Svirzhevsky
Astrophysical Space Science Transactions volume 7, pp 29-33 (2011).

Cosmic rays, solar activity and the climate
By T. Sloan
J. Physics. Conf. Ser. Vol. 3409, 012020 (2013)

Cosmic rays and climate change over the past 1000 million years
By T. Sloan and A. W. Wolfendale
New Astronomy volume 25 pp 45-49 (2013)

Cosmic rays and changes in atmospheric infra-red transmission
By A.D. Erlykin, T. Sloan and A.W. Wolfendale
Astroparticle Physics Volume 57 pp 26-29 (2014)