Nigel James Telfer SMITH

PhD MInstP FRAS CPhys PPhys

Profile

An experienced science research director, manager and astroparticle physicist. Leadership capability demonstrated at the SNOLAB deep underground research laboratory, leading a multi-skilled team to facilitate an international science programme. Managerial, strategic and project management ability proven through world-class facility management, international research collaboration and group management, and development and delivery of multi-million dollar research programmes. Experimental and analytical skills developed in cosmic ray, ultra high energy gamma ray and dark matter searches. Research specialisation in liquid noble gas and inorganic scintillation detector development, implementation in remote and extreme environments, and subsequent data analysis and physics interpretation. A highly motivated, challenge orientated, focused and well organised problem solver with good interpersonal and communication skills developed in team participation and leadership, university teaching, and extensive lecturing. An enthusiastic public communicator through school and public lectures, science centre development and media interactions.

Current Professional Positions

Director, SNOLAB Deep Underground Research Facility, Canada
Full Professor, Laurentian University , Canada
Visiting Professor, Imperial College, London, U.K.
Adjunct Professor, Queen's University, Canada

Professional Career

Director, SNOLAB, Canada	2009 – Present
Full Professor, Laurentian University , Canada	2015 – Present
Visiting Professor, Imperial College, London U.K.	2004 – Present
Adjunct Professor, Queens University , Canada	2009 – Present
Adjunct Professor, Laurentian University , Canada	2009 – 2015
UK STFC Research Council Individual Merit Fellow Level 3, U.K.	2009
Deputy Divisional Head (Precision Weak Physics), STFC RAL, U.K.	2002 – 2009
Spokesman, UK Dark Matter Collaboration	2002 – 2004
Group Leader (Dark Matter), STFC RAL, U.K.	1998 – 2009
Research Associate (Dark Matter), Imperial College, U.K.	1992 – 1998
Lecturer (Astrophysics), Leeds University, U.K.	1989 – 1992
Polar Observer (Antarctica), Bartol Research Foundation, U.S.A.	1987 – 1988

Professional Qualifications and Awards

Member of Canadian Institute of Particle Physics, Professional Physicist	2009, 2015
Member of Canadian Association of Physics	2009
Science and Engineering Ambassador (STEMNET)	2008
Member of the International Astronomical Union, and COSPAR	2006
Fellow of the Royal Astronomical Society	1995
Member of the Institute of Physics, Chartered Physicist	1993
US Congressional medal and winter-over bar for Antarctic duties	1988

Education

Ph.D. (Astrophysics), University of Leeds	1991
B.Sc. (Hons) Physics, University of Leeds	1985

Grant awards and funding held

CA$47M SNOLAB Operational funding (CFI/MEDI)	2012 – 2017
CA$750k MODCC Development (NOHFC jointly through CEMI)	2014 – 2015
CA$24M SNOLAB Operational funding (CFI/MRI/NSERC)	2009 – 2011
£1.2M ZEPLIN-III experimental grant budget holder (PPD SLA)	2007 – 2009
£330k CCLRC local and well-found lab bid	2006 – 2007
£4.4M UKDMC experimental grant budget holder (PPD SLA)	2003 – 2007
£2.4M Boulby JIF facility upgrade (through Sheffield University)	2000 – 2004

Professional Positions and Committee Membership

Member, KEK Project Implementation Plan Advisory Committee	2016 – present
Member, TRIUMF Policy and Programme Advisory Committee	2015 – present
Member, Boulby Underground Facility Science Advisory Board	2015 – present
Member, Oxford University Department of Particle Physics Advisory Board	2015 – present
Member, Fermilab LBNF/DUNE Long Baseline Neutrino Committee (LBNC)	2015 – present
Member, JingPing Laboratory International Advisory Committee	2014 – present
Member, Kavli IPMU, Tokyo, External Advisory Committee	2012 – present
Member, Canadian Light Source Science Advisory Committee	2011 – 2016
Board Member, Centre for Excellence in Mining Innovation	2010 – 2016
Member, Pacific Northwest National Laboratory, LDRD Review Panel	2013 – 2015
Member, DUSEL PRD Technical Review Committee	2009 – 2010
Member, STFC consultation panel (astroparticle physics)	2008
Member, PP2020 particle physics promotion group	2007 – 2009
Member, IOP Astroparticle Physics Group committee	2006 – 2009
Co-chair, ASPERA Dark Matter Working Group	2006 – 2008
Member, CCLRC Science and Technology Strategy Consultation Group	2006
Member, German Transregional Neutrino Research Centre Review Group	2006, 2009
Chair, CCLRC Science Business Unit Science Strategy Group	2005 – 2006
Co-ordinator (of 4), Centre for Fundamental Physics, CCLRC	2004 – 2009
ApPEC European Astro-particle Physics Co-ordination Peer Review	2002 – 2008
Scientific Secretary, CLRC Laboratory Executive Board	2005 – 2006
Member, UK Particle Physics User Advisory Committee (to CCLRC)	2002 – 2004
US NSF NESS Underground Laboratory Dark Matter Review	2002
Member, PPARC Projects Peer Review Panel	2001 – 2004
Scientific secretary, CLRC Quinquennial Review Stage 1 Review	2000 – 2001
UK Dark Matter Collaboration Management Boards	1998 – 2009

National and international proposal peer review (UK, Fr, Ca, In, Ge, Pt)	2002 – Present
Journal peer review (astroparticle physics)	2006 – Present

Conference/Workshop programme advisory committees
(IDM, Royal Society, NNN, INPC, CAP Congress, TAUP, SSP, Neutrino, WNPC, ICHEP)

Major Invited Conference Review Talks

Plenary Review (SNOLAB Science), CAP2014, Sudbury	2014
Plenary Review (dark matter), ICRC13, Rio de Janeiro	2013
Plenary Review (underground laboratories), ICATPP Villa Olmo, Como	2013
STFC Rutherford Laboratory Lawson lecture (public lecture)	2012
Invited Review (liquid noble dark matter), DarkAttack!, Ascona	2012
Plenary Review (underground laboratories), CIPANP, St.Petersberg	2012
Plenary Review (underground laboratories), LowNu11, Seoul	2011
Plenary Review (underground laboratories), TAUP, Munich	2011
Plenary Review (underground laboratories), ICHEP10, Athens	2010
Plenary Review (underground laboratories), INPC, Vancouver	2010
Plenary Review (dark matter), Lepton Photon 09	2009
Invited Review (dark matter), RAS, London	2008
Plenary Review (dark matter), PASCOS, London	2007
Invited Lecture (dark matter), ISPR-10, Coimbra	2006
Plenary Review (dark matter), Neutrino2006, Sante Fe	2006
Invited Review (dark matter) NAM, Milton Keynes	2004
Invited Review (dark matter) IAU2003, Sydney	2003
Royal Institution Friday Discourse	2002
Invited Review (dark Matter) PSD6, Leicester	2002
Plenary Review (low energy astrophysics) ICHEP00, Osaka	2000

Key Leadership Responsibilities

Director, SNOLAB, Canada ***July 2009 – Present***

Overall operational responsibility for the SNOLAB deep underground international science facility at Creighton mine, Sudbury, site of research awarded the 2015 Nobel prize in Physics. Responsibility includes delivery of the SNOLAB science programme, and co-ordinating strategic development of the Canadian science community. Re-appointed as Director in July 2014, following broad stakeholder engagement. Reporting, and accountable, to the SNOLAB Institute Board of Directors, including the five Canadian trustee Universities and Vale, the host mining company for SNOLAB. Provide interface between SNOLAB and the Canadian funding agencies, ensuring strategic direction is aligned with Canadian science objectives. Engage and support scientific community, local and national academic institutes and institutional partners, through external Board and advisory committee membership, to maximise connections to external stakeholders and ensure SNOLAB is central to international and domestic science strategies.

Responsibilities range from development of strategic and business planning models, development of funding, financial accountability, reporting to stakeholders including funding agencies and SNOLAB Institute Board, staff development and planning for the local 70-strong team, staff union engagement, development of robust and regulatory compliant health and safety practices, leadership and management of business process changes, selection and delivery management of SNOLAB science programme, public and professional outreach, and interactions with political groups. Responsible for facility team, with direct line management for research staff, managers and risk management group.

Deputy Divisional Head (Precision Weak Physics), R.A.L., U.K. ***Nov 2002 – July 2009***

Managerial responsibility for development of Precision Weak Physics section of STFC RAL Research Division A, totalling 20 staff. Responsibilities include staff and resource co-ordination and planning, report construction for research and departmental reviews, staff appraisal and representation on PPD management bodies.

Spokesman, UK Dark Matter Collaboration. ***Jul 2002 – Oct 2004***

Acted as interface between UK Dark Matter Collaboration and PPARC, reporting to PPARC Oversight Committee. Co-ordination and development of science strategy and management of UKDMC, including definition and dissemination of strategic aims and goals. Constructed oversight and financial reports, and project proposal for 2003-2007, leading to award of £5.1M to collaboration of 4 UK institutions. Provide strategic direction for the collaboration and assessment of future options, including brokerage of the LUX-ZEPLIN international collaboration merger. Act as interface to the Boulby facility management team, sitting on the Boulby Deep Underground Laboratory Steering Group. Monitor and provide financial co-ordination for the collaboration, and maintain financial authority.

Group Leader (Dark Matter), R.A.L., U.K. ***May 1998 – July 2009***

Manage research team of eight staff. Managerial responsibilities include staff development, staff appraisal, press and public interactions, grant application submission and project management. Joint supervision (with Imperial College) of students and post graduates. Teaching and lecturing through University seminars and advanced courses, including Particle Physics Masterclasses and public outreach.

Teaching Interests and Public Outreach

Taught and supervised undergraduate and postgraduate studies and courses as a lecturer at Leeds University, and more recently as adjunct and visiting professorships at Laurentian University and Imperial College. Taught at summer schools, tutored and mentored graduate students, and provided supervision to PhD candidates. An enthusiastic public understanding of science communicator, I lecture regularly to public, schools and astronomy groups, provide general public lectures at Science North and the STFC RAL Lawson lecture, and have presented a Friday Evening Discourse at the Royal Institution. I actively participate in education outreach events such as the Cheltenham Science Festival, and AAAS meetings, and organised a Royal Society event. I have extensive experience including national/international/satellite TV, Open University, international/local radio, broadsheets and magazines. Broadest impact through participation in the FCO 'UK Today' video series with a distribution in 80 countries and estimated 400 million audience.

Research Interests

Main research interests are the related fields of astro-particle, underground and ‘fundamental’ physics. Areas of these fields that particularly interest me are direct dark matter detection, neutrino-less double beta decay and high energy cosmic and gamma ray detection. The drive within these fields is to explore new physics outside the standard particle physics and astronomy models, either understanding the development and evolution of the Universe or the fundamental properties of particle or photons. A common element within these fields is the requirement to deliver unique, cutting-edge, detector systems into generally hostile or remote environments, which require innovative and interdisciplinary solutions drawing on many aspects of experimental physics.

Key Research Responsibilities

Full Professor, Laurentian University, Canada. ***July 2015 – Present***

Graduate teaching courses. Develop links between SNOLAB and Laurentian University for administrative and research opportunities. Create and support research funding applications.

Visiting Chair, Imperial College London, U.K. ***Oct 2004 – Present***

Graduate teaching courses. Developed links between STFC and ICL by a joint appointment at lecturer level, secured joint PhD studentship through PPD funding. Broadened R&D base to cover joint liquid noble gas development.

Adjunct Professor, Queen's University, Canada. ***August 2009 – Present***

Maintain research funding and resource oversight through Queen's research and finance office. Develop links between SNOLAB and Queen's University for administrative and research opportunities.

Adjunct Professor, Laurentian University, Canada. ***August 2009 – July 2015***

Graduate teaching courses. Develop links between SNOLAB and Laurentian University for administrative and research opportunities. Co-sponsored and co-organised 2014 CAP congress.

Group Leader (Dark Matter), R.A.L., U.K. ***May 1998 – July 2009***

Searching for the non-baryonic component of the galactic dark matter using liquid xenon scintillation and scintillation/ionisation detectors based at the Boulby underground facility.

ZEPLIN Project Scientist/Manager: Led an international (UK, US, EU) research team that designed, built, commissioned, deployed and exploited a 3.6kg single-phase and 35kg two-phase xenon target. Provided overall project management, leading commissioning and deployment decision process, and co-ordination of the exploitation, including major personal analysis leading to world class dark matter limits. Hands-on approach evidenced by >500 days spent underground in detector construction, commissioning and operation.

JIF Boulby Project Manager (1999-2003): Constructed Boulby component of PPARC sponsored JIF proposal, leading to award of £2.4M for upgrade to facilities. Project managed delivery of both surface and underground laboratories, including major design decisions, construction oversight, health and safety requirements, project and financial control. Project achieved under budget and beyond specification, with class 2500 clean room throughout. Led to opening of facility by Lord Sainsbury, Minister for Science, 2003.

Research Associate, Imperial College, U.K. ***Dec. 1992 – May 1998***

Searching for the non-baryonic component of the galactic dark matter using NaI scintillation detectors based 1100m underground at the Boulby halite and potash mine under Professor Peter Smith.

Responsibility for construction, commissioning and operation of an array of NaI detectors. Developed data analysis codes for NaI detectors, leading to identification of noise signatures and discrimination power, allowing calculation of dark matter limits. Lecturing through University seminars and advanced courses, including Goldsmith A-level teachers course.

Mine physics co-ordinator (1996-2001): Determine and implement underground experimental sequence through leadership of underground workforce. Interface between UKDMC and CPL mine operators. Oversee and co-ordinate health and safety requirements for experiments.

Lecturer, Leeds University, U.K. ***Sept. 1989 - Oct. 1992***

Researching point source emission of ultra high energy gamma rays using extensive air shower telescopes situated in Harrogate and at the South Pole, under Professor Alan Watson.

Research responsibilities: Aided design, installation and calibration of both telescopes. Leader of field team of four during 1991 austral summer implementing telescope control system upgrade. Managed team of three developing software for air shower reconstruction and point source searches from data collected at South Pole.

Teaching responsibilities: Lectured in electromagnetism and statistics. Undergraduate tutoring and laboratory convenor. Exam setting and marking. Ph.D. candidate supervision and viva examination. External A-level moderator.

Polar Observer, Bartol Research Foundation, U.S.A. ***July 1987 - Dec. 1988***

Constructed ultra high energy gamma ray telescope at Amundsen-Scott Station, South Pole, Antarctica.

First Briton to successfully 'winter-over' at the South Pole as sole operator of telescope, achieving 90% ontime during 8.5-month austral winter. Developed data analysis and verification software whilst on-site, and maintained and repaired hardware as appropriate, using resources as available.