Curriculum Vitae and Publication List

Craig D. Roberts

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Contents

1 Curriculum Vitae

NAME : Craig Darrian ROBERTS

BIRTHDATE : 1962

NATIONALITY : Citizen of the USA and Australian Citizen

ADDRESS : Physics Division
Argonne National Laboratory
Argonne, IL 60439-4843, USA
EMail: cdroberts@anl.gov
Tel: + 1 630 252 4095
Fax: + 1 630 252 6008
www: http://www.phy.anl.gov/theory/staff/cdr.html

DEGREES OBTAINED :

1988 - PhD, Theoretical Particle Physics,
Flinders University of South Australia
1984 - BSc (Hons), Theoretical Particle Physics,
Flinders University of South Australia.
∗ Awarded University Medal.
1983 - BSc, Theoretical Physics,
Flinders University of South Australia.
∗ Awarded Chancellor's Letter of Commendation.

EMPLOYMENT HISTORY :

2001 - Present: Group Leader, Theory
Argonne National Laboratory

2006 - Present: Senior Physicist (Grade 709, university equivalent – Prof.)
Argonne National Laboratory
2004 - 2006: Physicist (Grade 708, university equivalent – Assoc. Prof. Grade III)
Argonne National Laboratory
2002 - 2004: Physicist (Grade 707, university equivalent – Assoc. Prof. Grade II)
Argonne National Laboratory
1996 - 2001: Physicist (Grade 706, university equivalent – Assoc. Prof. Grade I)
Argonne National Laboratory
1991 - 1996: Assistant Physicist (Grade 705, university equivalent – Asst. Prof.)
Argonne National Laboratory

1989 - 1991: Postdoctoral Fellow, Argonne National Laboratory
1987 - 1989: Postdoctoral Fellow, University of Melbourne, Victoria

1997 - 2006: Adjunct Research Professor, Kent State University
1991 - 1995: Adjunct Research Scientist, Kent State University

2 Ten career-best publications

1. ROBERTS, C.D. and WILLIAMS, A.G.
Dyson-Schwinger Equations and their Application to Hadronic Physics
hep-ph/9403224; Prog. Part. Nucl. Phys. **33** (1994) pp. 477-575.
Citations: 414 ... *First major exposition of the application of continuum Green function methods to diverse strong coupling phenomena in quantum gauge field theory. A leading theme-setting paper in nuclear and particle physics (see page 3).*

2. ROBERTS, C. D.
Electromagnetic pion form-factor and neutral pion decay width
hep-ph/9408233; Nucl. Phys. A 605 (1996) pp. 475-495.
Citations: 102 ... *Pioneering symmetry-preserving study of hadron electromagnetic properties, which provides the foundation for all subsequent studies. First paper to demonstrate the essential interplay between dynamical chiral symmetry breaking (DCSB) and anomalies in gauge field theories.*

3. BENDER, A., ROBERTS, C.D. and SMEKAL, L. v.
Goldstone Theorem and Diquark Confinement Beyond Rainbow-Ladder Approximation
nucl-th/9602012; Phys. Lett. B 380 (1996) pp. 7-12.
Citations: 154 ... *This study introduced what remains today the only extant nonperturbative systematic symmetry-preserving truncation scheme of the Euler-Lagrange equations of quantum field theory.*

4. MARIS, P., ROBERTS, C. D. and TANDY, P. C.
Pion mass and decay constant
nucl-th/9707003; Phys. Lett. B 420 (1998) pp. 267-273.
Citations: 156 ... *First complete proof of Goldstone's theorem in quantum chromodynamics plus numerous corollaries, all with wide-ranging impact in both the perturbative and nonperturbative domains. Implications of the results proved are still being uncovered.*

5. MARIS, P. and ROBERTS, C. D.
π- and K-meson Bethe-Salpeter amplitudes
nucl-th/9708029; Phys. Rev. C 56 (1997) pp. 3369-3387.
Citations: 181 ... *First manifestly Poincaré covariant and symmetry preserving calculation of pseudoscalar meson properties. Illustrates the exact results proved in Ref. [4]. Foundation for most successful extant phenomenology of pseudoscalar and vector meson properties.*

6. IVANOV, M. A., KALINOVSKY, Yu. L. and ROBERTS, C. D.
Survey of heavy meson observables
nucl-th/9812063; Phys. Rev. D 60 (1999) 034018, 17 pages.
Citations: 101 ... *Article proves exact results for systems containing one light and one heavy quark; establishes that a long held assumption based on non-relativistic quark models is a corollary of the proof given; and provides first unified symmetry-preserving treatment of light- and heavy-quark systems.*

7. HECHT, M. B., ROBERTS, C.D. and SCHMIDT, S.M.
Valence Quark Distributions in the Pion
nucl-th/0008049; Phys. Rev. C 63 (2001) 025213 (8 pages).
Citations: 58 ... *First calculation of valence quark distribution in a bound state that is both a quark-antiquark composite and a Goldstone mode. Result reignited debate about the true form of the distribution in the valence region. Verifying the result I confirmed is crucial to the foundation of the Standard Model.*

8. HÖLL, A., KRASSNIGG, A. and ROBERTS, C.D.,
Pseudoscalar Meson Radial Excitations
nucl-th/0406030; Phys. Rev. C 70 (2005) 042203(R) (5 pages)
Citations: 40 ... *Proof in quantum chromodynamics that ground state pion lifetime is short because of magnitude of DCSB, and that when chiral symmetry is dynamically broken all pseudoscalar mesons except the ground state must decouple from the weak interaction in the limit of massless quarks. Establishes that effects of DCSB are felt over a wide range of energy scales.*

9. BHAGWAT, M.S., CHANG, L., LIU, Y.X., ROBERTS, C.D. and TANDY, P.C.
Flavour symmetry breaking and meson masses
arXiv:0708.1118 [nucl-th]; Phys. Rev. C 76 (2007) 045203 (10 pages)
Citations: 8 ... *Proves novel results in quantum chromodynamics that relate to the absence of a ninth Goldstone mode and the longstanding $U_A(1)$ problem. For example, establishes a necessary and sufficient condition for the absence of a ninth light pseudoscalar meson in QCD.*

10. EICHMANN, G., CLOËT, I.C., ALKOFER, R., KRASSNIGG, A. and ROBERTS,
Toward unifying the description of meson and baryon properties
arXiv:0810.1222 [nucl-th]; Phys. Rev. C 79 (2009) 012202(R) (5 pages)
Citations: 7 ... *First simultaneous prediction of meson and baryon observables using the leading-order in a symmetry-preserving truncation of the Dyson-Schwinger equations that can systematically be improved. The study connects hadron properties with the current-quark mass in QCD and provides a parameter-free prediction for the proton electric to magnetic form factor ratio that agrees with JLab's polarisation transfer data.*

NB. I have omitted numerous articles that have more citations than some of those in this list.

Comments on Significance and Impact

These ten articles highlight my contributions to the theory of relativistic quantum field theory and the phenomenology of hadron and particle physics, which were recognised in election to Fellowship of the American Physical Society in 2001:

"*For significant contributions to continuum modeling of QCD for hadron physics, linking both quark-gluon confinement and dynamical chiral symmetry breaking with light meson observables.*"

Here I append some additional observations.

- In a 2002 analysis of 63 128 publications in the SPIRES High-Energy Physics Database, Publication 1. in this list:

"Dyson-Schwinger Equations and their Application to Hadron Physics"

was identified as the fundamental reference for the fourth most important research theme in contemporary high-energy and nuclear physics. (143 distinct themes were identified.)

- Publication Impact
  NB. All citation information is compiled from the SPIRES data base:
  slac.stanford.edu/spires/hep/

	average citations/article
"Ten Best"	122

	no. published articles	average citations/pub.article	h-index	m-index
Career Figures	105	48	42	1.8

For explanations of the "h" and "m" indices, refer to *An index to quantify an individual's scientific research output*, J.E. Hirsch (UC, San Diego): physics/0508025, which reports that "A value m ~ 2, i.e. an h-index of 40 after 20 years of scientific activity, characterizes outstanding scientists, likely to be found only at the top universities or major research laboratories."

Reference Comparison ... Preprint Archives – "arXiv" http://arxiv.org/, end '07

	No. pub. articles in archive	average citations/pub. article
nucl-th archive	8551	15
hep-lat archive	3718	26
hep-ph archive	34633	29

3 Evidence of impact on and major contributions to the field

Awards/Prizes

2003: Recipient, *Friedrich Wilhelm Bessel Research Award*
Alexander von Humboldt Foundation ... awarded " ... *to young, top-flight scientists and scholars from abroad who are already recognized as outstanding researchers in their fields.*"
Just five prizes were awarded in nuclear and particle physics in 2003. Mine was the only one presented to a US-based scientist.

2001: Elected Fellow of the American Physical Society ... *For significant contributions to continuum modeling of QCD for hadron physics, linking both quark-gluon confinement and dynamical chiral symmetry breaking with light meson observables.*

2001-2002: *Mercator-Gastprofessor* of the German Research Foundation (*DFG*) ... *The programme is designed to enable Universities in Germany to invite highly qualified scientists and scholars (as a rule foreign nationals) from abroad. A Mercator Guest Professorship should provide a visible accent of quality in the host University's activities.*

2008: Gordon Godfrey Fellow, School of Physics, University of New South Wales

1996: Distinguished Visiting Scholar, Faculty of Science, University of Adelaide

Significance/Impact of Publications

- General Comparison:
  - Total number of citations to 105 published articles in SPIRES– 5032;
    average citations/article = 48, which is **3-times the average** for articles posted on the nuclear theory archive: http://arxiv.org/archive/nucl-th.
  - Articles, Sec. 2: average no. citations/year/article = 13
    cf. nuclear theory archive average = 2 citations/year/article for published papers posted within this period.
  - Total number of articles with more than 100 citations – 10
    Total number of articles in the **top 100** *nucl-th* publications – 5;
    NB. Only 41 (out of $\approx 9\,000$; i.e., 0.5%) *nucl-th* articles have more citations than Ref. [61] on page 14. (This exposition of continuum Green function methods applied to quantum gauge field theory at nonzero temperature and density is responsible for major growth in this field.)
  - Total number of articles with more than 50 citations – 34
    NB. I hold authorship of 0.6% of the articles in the nucl-th archive. My papers are responsible for 5.0% of all nucl-th articles with 50 citations or more.
  - 29% of my published articles have appeared in journals/journal-sections dedicated *to the rapid publication of important new results in nuclear and particle physics.*

- I have 42 articles cited 42 times or more; i.e., an *h-index* of **42**. My *m-index* is **1.8**. (*m-index* = h-index/Y, where Y is the number of years elapsed since publication of an individual's first paper.) These indices and their significance are described in the arXiv

article physics/0508025, which reports that "A value m ~ 2, i.e. an h-index of 40 after 20 years of scientific activity, characterizes outstanding scientists, likely to be found only at the top universities or major research laboratories."

(NB. Verification material available at http://www.phy.anl.gov/theory/staff/cdr.html.)

Community Oversight

- **Editorial** – 2002-2004 & 2005-2007 & 2007-2010, Field Editor (Elementary Particles and Fields) Few Body Systems; viz., three consecutive terms, thus far.
- **Oversight Panels**:
  2007: Chairman, National Science Foundation Nuclear Theory Proposal Review Panel
  2006: Member, National Science Foundation Nuclear Theory Proposal Review Panel
  2004 & 2005 – Member, Science and Technology Review Panel for Thomas Jefferson National Accelerator Facility
- **Referee** – European Physical Journal A; Few Body Systems; Fizika B; International Journal of Modern Physics A; Journal of Physics A; Journal of Physics G; Journal of High Energy Physics; Modern Physics Letters; New Journal of Physics; Nuclear Physics A; Nuclear Physics B; Physical Review Letters; Physics Letters B; Physical Review C; Physical Review D; Progress in Particle and Nuclear Physics
- **Reviewer**: Grant Applications – Argonne Joint Theory Institute; Argonne Strategic Theory Institute; Australian Research Council; Helmholtz Gemeinschaft, Germany; INFN, Italy; International Science Foundation; Netherlands' Physics Research Council; US Civilian Research & Development Foundation (CRDF); US Department of Energy; US National Science Foundation
- **Reviewer**: PostGraduate Theses – U. Adelaide (2), Sth. Australia; Flinders U. (1), Sth. Australia; U. Rostock, Germany (2).

Community Leadership

- **Executive**
  2008 – "Past-chair" of the Hadron Physics Topical Group, American Physical Society
  2007 – "Chair" of the Hadron Physics Topical Group, American Physical Society
  2006 – "Chair-Elect" of the Hadron Physics Topical Group, American Physical Society
  2005 – "Vice-Chair" of the Hadron Physics Topical Group, American Physical Society
  2003 & 2004 – Member, Executive Committee of the Hadron Physics Topical Group, American Physical Society
- **Member, International Advisory Committee: 11 International Conferences**; e.g., "19th IUPAP Few-Body Physics Conference," Bonn, Germany, 2009.
- **Organiser: 19 International Meetings**; e.g., Chairman, Organising Committee of the workshop on "Hadron Form Factors," ECT*, Trento, Italy, March 12-23, 2008
- **Planning** – "Key Issues in Hadronic Physics," briefing paper presented at the Hadronic and Electromagnetic Probes Town Meeting, 1-4/Dec./2000, as part of the USA's Nuclear Science Year 2001 Long Range Plan process

- **Session Convener: 2 International Conferences**; e.g., "9th International Symposium on Meson-Nucleon Physics and the Structure of the Nucleon (MENU2001)," Washington, DC, 26-31 July, 2001

Community Impact

- **59 Invited Presentations at International Meetings/Workshops**; e.g., "Hadron Form Factors & DSEs," presented at LIGHT CONE 2008: RELATIVISTIC NUCLEAR AND PARTICLE PHYSICS, European Physical Society Mulhouse, France – 7-11 July 2008
- **Invited Lecturer: 15 Graduate Student Schools**; e.g., 4 Lectures entitled *Dyson-Schwinger Equations and QCD* presented at the 25TH STUDENT'S WORKSHOP ON ELECTROMAGNETIC INTERACTIONS, Bosen (Saar) Germany – 31 August - 5 September 2008
- **Seminars, Colloquia and Lectures** – I have given a total of over **170** presentations at research institutes and conferences worldwide.

Research Coordination
∘ Since 1996 I have coordinated collaborations involving 40 PhD Scientists and 14 graduate students from 26 different research centres [6 in the USA and another 20 worldwide]
∘ I oversaw the preparation of a Collaborative Research Agreement between Argonne National Laboratory and the Munich *Excellence Cluster for Fundamental Physics* (http://www.universe-cluster.de)
∘ I oversaw a Collaborative Research Agreement between Argonne National Laboratory, and the Department of Physics and Mathematical Physics and the Special Centre for the Subatomic Structure of Matter at the University of Adelaide

Graduate Training – Since 1995, I have directly supervised **16** postdoctoral fellows at Argonne National Laboratory, and played an adjunct role in the supervision of 9 PhD students and 2 Diploma Students. NB. The benchmark in the USA is 0.45 postdoctoral-fellows/staff-member/year, whereas I typically supervise two per year; viz., my commitment to postdoctoral fellows is more than 4-times the National average.

Postdoctoral Supervision

1. Hovhannes GRIGORYAN, 2008-present ... Laboratory Director's Fellow, Argonne National Laboratory
2. Ross YOUNG, 2007-present ... Eugene P. Wigner Fellow, Argonne National Laboratory
3. Bruno EL-BENNICH, 2007-present ... Argonne National Laboratory
4. Thomas KLÄHN, 2007-present ... Argonne National Laboratory
5. Ian CLOËT, 2007-2008 ... Argonne National Laboratory
   Currently, Postdoctoral Fellow ... University of Washington in Seattle
6. Mandar BHAGWAT, 2006-2007 ... Argonne National Laboratory
   Currently, Postdoctoral Fellow ... Harvard Medical School
7. Stewart V. WRIGHT, 2004-2006 ... Argonne National Laboratory
   Currently ... Financial market analyst, Sydney, Australia

8. Prashanth JAIKUMAR, 2004-2006 ... Argonne National Laboratory
   Currently ... Asst. Prof., Institute of Mathematical Sciences, Chennai, India

9. Arne HÖLL, 2003-2005 ... Argonne National Laboratory
   Currently ... Asst. Head of Division – Energy Research, German Federal Ministry of Economics and Technology

10. Andreas KRASSNIGG, 2003-2005 ... Argonne National Laboratory
    Erwin Schrödinger Fellow, Funded by Austrian Ministry of Education,
    Winner of 2002 Austrian Prize for Academic Excellence
    Currently ... Research Fellow, Institut für Physik, Universität Graz, Austria

11. Martin HECHT, 2000-2001
    Currently ... Patent Lawyer, Melbourne, Australia

12. Sebastian SCHMIDT, 1999-2000
    Fiodor Lynen Fellow, Funded by Alexander von Humboldt Foundation
    Currently ... Divisional Director of "Structure of Matter and Key Technologies" at Research Centre, Jülich, Germany
    Until 2007 ... Managing Director, Helmholtz Gemeinschaft, Germany
    (The Helmholtz Gemeinschaft is Germany's equivalent of the Department of Energy.)

13. Jacques BLOCH, 1998-1999
    Currently ... Research Associate, University of Regensburg, Germany

14. Pieter MARIS, 1996-1998
    Currently ... Research Fellow, Department of Physics and Astronomy, Iowa State University, USA

15. Lorenz von SMEKAL, 1996-1997
    Currently ... Lecturer, University of Adelaide, Australia

16. Axel BENDER, 1995-1996
    Currently ... Officer for Concept Studies and Analysis, Land Operations Division, Defence Science and Technology Organisation, Australia

4 Complete Lists: Publications & Invited Talks

4.1 Refereed Articles

1. CAHILL, R.T. and ROBERTS, C.D.
Soliton bag models of hadrons from QCD.
Phys. Rev. D 32 (1985) 2419.

2. ROBERTS, C.D. and CAHILL, R.T.
Dynamically selected vacuum field configuration in massless QED
Phys. Rev. D 33 (1986) 1755.

3. ROBERTS, C.D. and CAHILL, R.T.
A bosonisation of QCD and realisations of chiral symmetry
Aust. J. Phys. 40 (1987) 499.

4. PRASCHIFKA, J., ROBERTS, C.D. and CAHILL, R.T.
A study of $\rho \to \pi\pi$ decay in a global colour model for QCD
Int. J. Mod. Phys. A 2 (1987) 1797.

5. PRASCHIFKA, J., ROBERTS, C.D. and CAHILL, R.T.
QCD bosonisation and the meson effective action
Phys. Rev. D 36 (1987) 209.

6. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Calculation of diquark masses in QCD
Phys. Rev. D 36 (1987) 2804.

7. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Why baryons are not skyrmions
Aust. J. Phys. 41 (1988) 11.

8. PRASCHIFKA, J., CAHILL, R.T. and ROBERTS, C.D.
Chiral QCD generates constituent quark masses
J. Mod. Phys. Lett. A 3 (1988) 1595. ..... [E]

9. ROBERTS, C.D., CAHILL, R.T. and PRASCHIFKA, J.
The effective action for the Goldstone Modes in a global colour symmetry model of QCD
Ann. Phys. 188 (1988) 20.

10. ROBERTS, C.D., CAHILL, R.T. and PRASCHIFKA, J.
QCD and a calculation of the ω-ρ mass splitting
Int. J. Mod. Phys. A 4 (1989) 719.

11. CAHILL, R.T., ROBERTS, C.D. and PRASCHIFKA, J.
Baryon structure and QCD
Aust. J. Phys. 42 (1989) pp. 129-145.

12. ROBERTS, C. D., PRASCHIFKA, J. and CAHILL, R. T.
A Chirally Symmetric Effective Action For Vector And Axial Vector Fields In A Global Color Symmetry Model Of QCD
Int. J. Mod. Phys. A 4 (1989) 1681.

13. PRASCHIFKA, J., CAHILL, R. T. and ROBERTS, C. D.
Mesons And Diquarks In Chiral QCD: Generation Of Constituent Quark Masses
Int. J. Mod. Phys. A **4** (1989) 4929.

14. ROBERTS, C. D.
Nonlinear Quantum Mechanics: Two Possibilities
Mod. Phys. Lett. A **5** (1990) 91. ..... [E]

15. ROBERTS, C. D. and MCKELLAR, B. H. J.
Critical Coupling For Dynamical Chiral Symmetry Breaking
Phys. Rev. D **41** (1990) 672.

16. WILLIAMS, A. G., KREIN, G. and ROBERTS, C. D.
Modelling the quark propagator
Annals Phys. **210** (1991) 464.

17. BURDEN, C. J. and ROBERTS, C. D.
Light Cone Regular Vertex In Quenched QED In Three-Dimensions
Phys. Rev. D **44** (1991) 540.

18. BURDEN, C.J., ROBERTS, C.D. and WILLIAMS, A.G.
Singularity structure of a model quark propagator
Phys. Lett. B 285 (1992) 347. ..... [E]

19. ROBERTS, C.D. WILLIAMS, A.G. and KREIN, G.
On the Implications of Confinement
Int. J. Mod. Phys. A 7 (1992) 5607.

20. BURDEN, C.J., PRASCHIFKA, J. and ROBERTS, C.D.
Photon Polarisation tensor and gauge dependence in three-dimensional quantum electrodynamics
hep-th/9303098, Phys. Rev. D46 (1992) 2695.

21. HOLLENBERG, L.C.L., ROBERTS, C.D. and McKELLAR, B.H.J.
Two loop calculation of the ω-ρ mass splitting
Phys. Rev. C 46 (1992) 2057.

22. BURDEN, C.J. and ROBERTS, C.D.
Gauge covariance and the fermion-photon vertex in three- and four-dimensional, massless quantum electrodynamics
hep-th/9303098, Phys. Rev. D47 (1993) 5581.

23. ROBERTS, C.D., CAHILL, R.T., SEVIOR, M.E., IANNELLA, N.
π-π scattering in a QCD based model field theory
hep-ph/9304315, Phys. Rev. D 49 (1994) pp. 125-137.

24. HAWES, F.T., ROBERTS, C.D. and WILLIAMS, A.G.
Dynamical chiral symmetry breaking with an infrared vanishing gluon propagator?
hep-ph/9309263, Phys. Rev. D 49 (1994) pp. 4683-4693.

25. ROBERTS, C.D. and WILLIAMS, A.G.
Dyson-Schwinger Equations and their Application to Hadronic Physics
hep-ph/9403224, Prog. Part. Nucl. Phys., 33 (1994) pp. 475-575.

26. MITCHELL, K.L., TANDY, P.C., ROBERTS, C.D. and CAHILL, R.T.
Charge symmetry breaking via ρ-ω mixing from model quark-gluon dynamics
hep-ph/9403223, Phys. Lett. B335 (1994) pp. 282-288. ..... [E]

27. DONG, Z., MUNCZEK, H.J. and ROBERTS, C.D.
Gauge covariant fermion propagator in quenched, chirally-symmetric quantum electrodynamics
hep-ph/9403252, Phys. Lett. B 333 (1994) pp. 536-544. ..... [E]

28. ALKOFER, R., BENDER A., ROBERTS, C.D.
Pion loop contribution to the electromagnetic pion charge radius
hep-ph/9312243, Intern. J. Mod. Phys. A 10 (1995) pp. 3319-3342.

29. FRANK, M.R., MITCHELL, K.L., ROBERTS, C.D. and TANDY, P.C.
Off shell axial anomaly via the $\gamma^*\pi \to \gamma$ transition
hep-ph/9412219, Phys. Lett. B 359 (1995) pp. 17-22. ..... [E]

30. FRANK, M.R. and ROBERTS, C.D.
Model gluon propagator and pion and rho-meson observables
hep-ph/9508225, Phys. Rev. C 53 (1996) pp. 390-398.

31. ALKOFER, R and ROBERTS, C.D.
Calculation of the anomalous $\gamma\pi^* \to \pi\pi$ form factor
hep-ph/9510284, Phys. Lett. B 369 (1996) pp. 101-107. ..... [E]

32. BURDEN, C.J., ROBERTS, C.D. and THOMSON, M.J.
Electromagnetic Form Factors of Charged and Neutral Kaons
nucl-th/9511012, Phys. Lett. B 371 (1996) pp. 163-168. ..... [E]

33. BENDER, A., ROBERTS, C.D. and v. SMEKAL, L.
Goldstone theorem and diquark confinement beyond rainbow ladder approximation

nucl-th/9602012, Phys. Lett. B 380 (1996) pp. 7-12. ..... [E]

34. ROBERTS, C.D.
Electromagnetic Pion Form Factor and Neutral Pion Decay Width
hep-ph/9408233, Nucl. Phys. A 605 (1996) pp. 475-495.

35. HAWES, F.T., WILLIAMS, A.G. and ROBERTS, C.D.
Renormalization and chiral symmetry breaking in quenched QED in arbitrary covariant gauge
hep-ph/9604402, Phys. Rev. D 54 (1996) pp. 5361-5372.

36. BENDER, A., BLASCHKE, D., KALINOVSKY, Yu.L. and ROBERTS, C.D.
Continuum study of deconfinement at finite temperature
nucl-th/9606006, Phys. Rev. Lett. 77 (1996) pp. 3724-3727. ..... [E]

37. BURDEN, C.J., LU QIAN, ROBERTS, C.D., TANDY, P.C. and THOMSON, M.J.
Ground-state spectrum of light-quark mesons
nucl-th/9605027, Phys. Rev. C 55 (1997) pp. 2649-2664.

38. KALINOVSKY, Yu.L., MITCHELL, K.L. and ROBERTS C.D.
$K_{\ell 3}$ and π_{e3} transition form factors
nucl-th/9610047, Phys. Lett. B 399 (1997) pp. 22-28. ..... [E]

39. IVANOV, M.A., KALINOVSKY, Yu.L., MARIS, P. and ROBERTS, C.D.
Semileptonic decays of heavy mesons
nucl-th/9704039, Phys. Lett. B 416 (1998) pp. 29-35. ..... [E]

40. BLASCHKE, D., ROBERTS, C.D. and SCHMIDT, S.
Thermodynamic properties of a simple, confining model
nucl-th/9706070, Phys. Lett. B 425 (1998) pp. 232-238. ..... [E]

41. MARIS, P., ROBERTS, C.D. and TANDY, P.C.
Pion mass and decay constant
nucl-th/9707003, Phys. Lett. B 420 (1998) pp. 267-273. ..... [E]

42. MARIS, P. and ROBERTS, C. D.
π- and K-meson Bethe-Salpeter amplitudes
nucl-th/9708029, Phys. Rev. C 56 (1997) pp. 3369-3387.

43. BENDER, A., POULIS, G.I., ROBERTS, C.D., SCHMIDT, S.M. and THOMAS, A. W.
Deconfinement at finite chemical potential
nucl-th/9710069, Phys. Lett. B 431 (1998) pp. 263-269. ..... [E]

44. IVANOV, M.A., KALINOVSKY, Yu.L., MARIS, P. and ROBERTS, C.D.
Heavy- to light-meson transition form factors
nucl-th/9711023, Phys. Rev. C 57 (1998) pp. 1991-2003.

45. MARIS, P., ROBERTS, C.D. and SCHMIDT, S.M.
Chemical potential dependence of π and ρ properties
nucl-th/9801059, Phys. Rev. C 57 (1998) pp. R2821-R2825.

46. BLASCHKE, D., GRIGORIAN. H., POGHOSYAN. G, ROBERTS, C.D. and SCHMIDT, S.M.
A dynamical, confining model and hot quark stars
nucl-th/9801060, Phys. Lett. B 450 (1999) pp. 207-214. ..... [E]

47. BLASCHKE, D., HÖLL, A., ROBERTS, C. D. and SCHMIDT, S.M.
Analysis of chiral and thermal susceptibilities
nucl-th/9803030, Phys. Rev. C 58 (1998) pp. 1758-1766.

48. MARIS, P., and ROBERTS, C.D.
Pseudovector components of the pion, $\pi^0 \to \gamma\gamma$, and $F_\pi(q^2)$
nucl-th/9804062, Phys. Rev. C 58 (1998) pp. 3659-3665.

49. ROBERTS, C.D.
Nonperturbative effects in QCD at Finite Temperature and Density
nucl-th/9806088, Fiz. Élem. Chastits At. Yadra **30** (1999) pp. 537-612 (Phys. Part. Nucl. **30** (1999) 223).

50. HAWES, F. T., MARIS, P., and ROBERTS, C.D.
Infrared Behaviour of Propagators and Vertices
nucl-th/9807056, Phys. Lett. B 440 (1998) pp. 353-358. ..... [E]

51. HÖLL, A., MARIS, P. AND ROBERTS, C.D.
Mean field exponents and small quark masses
nucl-th/9808076, Phys. Rev. C 59 (1999) pp. 1751-1755

52. IVANOV, M.A., KALINOVSKY, Yu.L. and ROBERTS, C.D.
Survey of heavy meson observables
nucl-th/9812063, Phys. Rev. D 60 (1999) 034018, 17 pages.

53. BLOCH, J.C.R., KALINOVSKY, Yu.L., ROBERTS, C.D. and SCHMIDT, S.M.
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4.4 Conference Proceedings

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10. ROBERTS, C. D.
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11. IVANOV, M.A., KALINOVSKY, Yu.L., MARIS, P. and ROBERTS, C D.
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17. HECHT, M.B., ROBERTS, C.D. and SCHMIDT, S.M.
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18. HECHT, M.B., ROBERTS, C.D. and SCHMIDT, S.M.
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19. PROZORKEVICH, A.V., VINNIK, D.V., SCHMIDT, S.M., HECHT, M.B. and ROBERTS, C.D.
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22. HÖLL, A., KRASSNIGG, A. AND ROBERTS, C.D.
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nucl-th/0311033, in the Proceedings of "LC03: Light Cone Workshop - Hadrons and Beyond," Grey College, University of Durham, 5-9/August/2003, edited by S. Dalley, http://www.mpi-hd.mpg.de/ilcac/Durham03/lc03proc.html

23. BHAGWAT, M.S. and ROBERTS, C.D.
Chiral dynamics from Dyson-Schwinger equations
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4.5 Books Edited

1. **Understanding Deconfinement in QCD**,
edited by D. Blaschke, F. Karsch and C.D. Roberts
(World Scientific, Singapore, 2000) 354 pages.

2. **Opportunities with Exotic Beams**,
edited by Thomas Duguet, Henning Esbensen, Kenneth M Nollett and Craig D Roberts
(World Scientific, Singapore, 2007) 248 pages.

4.6 Invited Talks

1. **Research Programmes in the Physics Division at ANL**, presented at the 4th Annual Summer School in Nuclear Physics Research, University of Wisconsin at Madison, 20/June/1991.

2. **Schwinger-Dyson Equations: Dynamical Chiral Symmetry Breaking and Confinement**, presented at the Workshop on QCD Vacuum Structure, American University of Paris, 1-5 June, 1992.

3. **From π-π Scattering to the Quark-Quark Interaction and Hadronic Faddeev Amplitudes**, presented at the inaugural meeting at the European Centre for Theoretical Physics: The Quark Structure of Baryons, Trento, Italy, 4-15 October, 1993.

4. **Can an infrared vanishing gluon propagator confine quarks?** presented at the Workshop on Quantum Infrared Physics, American University of Paris, 6-10 June, 1994.

5. **QCD and π-π scattering**, presented at the Chiral Dynamics: Theory and Experiment Workshop, MIT, 25-29 July, 1994.

6. **Dyson-Schwinger Equations and Hadronic Observables in QCD**, presented at the Joint April Meeting of the American Physical Society and The American Association of Physics Teachers, Washington DC, 18-21 April, 1995.

7. **Hadronic Observables and QCD**, presented at the 1995 Gordon Research Conference on QCD in Nuclear Physics and Astrophysics, Tilton, NH July 24-28, 1995.

8. **QCD at Diverse Length-scales via Dyson-Schwinger Equations**, presented at the Workshop on Nonequilibrium Physics at Short Time-Scales, Max-Planck

Gesellschaft Arbeitgruppe: "Theoretische Vielteilchenphysik", University of Rostock, Rostock, Germany, 28/Feb./1996.

9. **Probing QCD at Diverse Length-Scales via the Dyson-Schwinger Equations**, presented at the 6TH INTERNATIONAL WORKSHOP ON LIGHT-CONE PHYSICS AND NONPERTURBATIVE QCD, Ames, IA, 3-14/Jun./1996.

10. **Dyson-Schwinger Equations: Diquark Confinement and Goldstone's Theorem**, presented at the 2ND INTERNATIONAL CONFERENCE ON QUARK CONFINEMENT AND THE HADRON SPECTRUM, Como, Italy, 26-30/Jun./1996.

11. **Dyson-Schwinger Equations: Diquark Confinement and Goldstone's Theorem**, presented at the WORKSHOP ON CURRENT PROBLEMS IN THREE BODY PHYSICS, Max-Planck Gesellschaft Arbeitgruppe: "Theoretische Vielteilchenphysik", University of Rostock, Rostock, Germany, 8-9/Jul./1996.

12. **Photo-hadron processes as a probe of bound-state structure**, presented at the 1996 GORDON RESEARCH CONFERENCE ON PHOTONUCLEAR PHYSICS, Tilton, NH July 29 - Aug 2, 1996.

13. **Continuum order parameter for deconfinement**, presented at the 25TH INTERNATIONAL WORKSHOP ON GROSS PROPERTIES OF NUCLEI AND NUCLEAR EXCITATIONS, Hirschegg, Austria, 13-18/Jan./1997.

14. **Confinement and Hadron Form Factors**, presented at the BONN WORKSHOP ON CONFINEMENT PHYSICS, Institute for Theoretical Physics, University of Bonn, Bonn, Germany, 28/Jul - 8/Aug/97.

15. **Hadrons at extremes of temperature and density**, presented at the WORKSHOP ON NONPERTURBATIVE METHODS IN QUANTUM FIELD THEORY, Special Research Centre for the Subatomic Structure of Matter, University of Adelaide, South Australia, Australia, 2-13/Feb./98.

16. **Probing the QCD running coupling in the infrared**, presented at the WORKSHOP ON PHYSICS WITH 8+ GEV PHOTONS, Carnegie-Mellon University, Pittsburgh, PA 13-14/Mar./98.

17. **Hadron properties at extremes of temperature and density**, presented at the WORKSHOP ON QCD AT FINITE BARYON DENSITY, University of Bielefeld, Bielefeld, Germany 27-30/April/98

18. **Dyson-Schwinger Equations - Connecting small and large length-scales**, presented at the INTERNATIONAL CONFERENCE ON NUCLEAR AND PARTICLE PHYSICS WITH CEBAF AT JEFFERSON LAB, Dubrovnik, Croatia, 3-10/November/1998

19. **Dyson-Schwinger Equations: Confinement and DCSB**, presented at the Worshop on UNDERSTANDING DECONFINEMENT IN QCD, ECT*, Trento, Italy, 1-13/March/1999

20. **Dyson-Schwinger Equations and Hadron Phenomenology**, presented at the Workshop on Light-cone QCD and Nonperturbative Hadron Physics, Centre for the Subatomic Structure of Matter, University of Adelaide, Adelaide, Australia 13-22/Dec./1999

21. **Dyson-Schwinger Equations and Continuum Strong QCD**, presented at the Confinement Research Program, Erwin Schrödinger International Institute for Mathematical Physics" Vienna, Austria, May-Jul./2000

22. **Diquarks and Density**, presented at the Worshop on The Physics of Neutron Star Interiors, ECT*, Trento, Italy, 19/Jun.-7/Jul./2000

23. **Contemporary Applications of Dyson-Schwinger Equations**, presented at Confinement IV: The 4th International Conference on Quark Confinement and the Hadron Spectrum, Vienna, Austria, 3-8/Jul./2000.

24. **Dyson-Schwinger Equations - Aspects of the Pion**, presented at DPF 2000, the Annual Meeting of the Division of Particles and Fields of The American Physical Society, Columbus, OH, 9-12/Aug./2000

25. **Dyson-Schwinger Equations and Few Quark Systems**, presented at the Worshop on Relativistic Dynamics and Few Hadron Systems, ECT*, Trento, Italy, 6-17/Nov./2000

26. **Character of Goldstone Bosons**, presented at the Workshop on Lepton Scattering, Hadrons and QCD, Special Centre for the Subatomic Structure of Matter (CSSM), Adelaide, Australia, 26/Mar-6/Apr./2001

27. **Dyson-Schwinger Equations: From charge radii to deep inelastic scattering**, presented at the 9th International Symposium on Meson-Nucleon Physics and the Structure of the Nucleon, George Washington University, Washington DC, 26-31/Jul./2001

28. **Dyson-Schwinger Equations and Continuum QCD**, presented at the Workshop on Quarks and Hadrons in Continuum Strong QCD, Universität Tübingen, Tübingen, Germany, 3-6/Sept./2001

29. **Goldstone boson's valence quark distribution**, presented at the 11th Light-Cone Workshop – Light-Cone Physics: Particles and Strings, ECT*, Trento, Italy, 3-11/Sept./2001

30. **Confinement and dynamical chiral symmetry breaking**, presented at the International Conference on Quark Nuclear Physics (QNP2002), Forschungszentrum Jülich, Jülich, Germany, 9-14/Jun./2002

31. **Poincaré covariant study of hadrons**, presented at the Argonne Theory Institute Hadron Structure and GeV electroweak interactions, Argonne, IL, 29/Jul.-2/Aug./2002

32. **Pions and the nucleon**, presented at the Workshop on the Structure of the Nucleon, ECT*, Trento, Italy, 2-10/Sept./2002

33. **Aspects of dynamical chiral symmetry breaking**, presented at the 5th International Conference on Quark Confinement and the Hadron Spectrum, Gargnano, Italy, 10-14/Sept./2002

34. **Dyson-Schwinger Equations: A Tool for Hadron Physics**, presented at the Symposium in honour of Jrg Hfner, Ladenburg, Germany, 19-21/Dec./2002

35. **Quark Distributions in the Pion**, presented at the 2nd International Conference on Nuclear and Particle Physics with CEBAF at JLab (NAPP 2003), Dubrovnik, Croatia, 26-31/May/2003.

36. **Dyson-Schwinger Equations: A Tool for Hadron Physics**, presented at the 17th International Conference on Few-Body Problems in Physics, Duke University/TUNL, Raleigh, NC, 5-10/Jun./2003

37. **Pions and the Nucleon**, presented at the Workshop on Aspects of Nonperturbative QCD - Hadrons and Thermodynamics, Physics Department, University of Rostock, 13-16/Jul./2003

38. **Dyson-Schwinger Equations: The Pion and Related Matters**, presented at the Light Cone Workshop: Hadrons and Beyond, Institute for Particle Physics Phenomenology and Grey College, University of Durham, Durham, UK, 5-9/Aug./2003

39. **Confinement, DCSB, Bound States, and the Quark-Gluon Vertex**, presented at QCD Down Under, Special Research Centre for the Subatomic Structure of Matter (CSSM), Adelaide, 10-19/Mar./2004

40. **Dyson-Schwinger Equations and Observables**, presented at the Helmholtz Foundation's Virtual Institute Workshop on Dense Hadronic Matter and the QCD Phase Transition, Bad Honnef, Germany, 2-4/Jul./2004

41. **Dyson-Schwinger Equations and Observables in Hadron Physics**, presented at the 10th International Symposium on Meson-Nucleon Interactions and the Structure of the Nucleon, MENU04, Institute of High Energy Physics, The Chinese Academy of Sciences, Beijing, China, 30/Aug.-4/Sept./2004

42. **A Perspective on Hadron Physics**, presented at the Xth Mexican Workshop on Particles and Fields, Institute of Physics and Mathematics, University of Morelia, Morelia, Mexico, 6-12/Nov./2005.

43. **Symmetries and Bound States**, presented at Light Cone 2006, Light-Cone QCD and Nonperturbative Hadron Physics , Minneapolis Campus of the University of Minnesota, 15-19 May, 2006.

44. **Continuum Nonperturbative Hadron Physics**, presented at the IVth International Conference on Quarks and Nuclear Physics, Madrid, 5th-10th June 2006.

45. **Hadron Physics as a Covariant Few Body Problem**, presented at the 18th International IUPAP Conference on Few-Body Problems in Physics, Santos, São Paulo, Brazil, 21-26 August, 2006.

46. **Chiral Dynamics from Dyson-Schwinger Equations**, presented at the 5th International Workshop on Chiral Dynamics, Theory and Experiment, Durham/Chapel Hill, NC – September 18-22, 2006

47. **Baryons through the DSQCD looking glass**, presented at the Workshop on Confinement: connecting the light- and heavy-quark domains, ECT* European Centre for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy – March 12-16, 2007

48. **Covariance, Dynamics and Symmetries, and Hadron Form Factors**, presented at the Workshop on Exclusive Reactions at High Momentum Transfer, Jefferson Lab, Newport News, VA – May 21-24, 2007

49. **Dynamical Chiral Symmetry Breaking and Hadron Structure**, presented at the Argonne Joint Theory Institute Workshop on Strong Dynamics and Dynamical Chiral Symmetry Breaking, Argonne National Laboratory, Argonne, IL – June 4-5, 2007

50. **Dyson-Schwinger Equations – Achievements and Challenges**, presented at the Workshop on Dyson-Schwinger equations and their applications, Physics Department, Peking University, Beijing, China – August 14-18, 2007

51. **Dynamics, Symmetries, and Hadron Properties**, presented at the 11th International Symposium On Meson-Nucleon Physics And The Structure Of The Nucleon (MENU 2007), IKP, Forschungzentrum Jülich, Germany – September 10-14, 2007

52. **Hadron Properties and Dyson-Schwinger Equations**, presented at the International School of Nuclear Physics, Erice-Sicily – 29th Course: Quarks in Hadrons and Nuclei – 16-24 September, 2007

53. **Calculation of Parton Distribution Functions**, presented at the Workshop on Nonperturbative Aspects of Field Theories, 2007, Instituto de Física y Matemáticas, Universidad Michoacana, Morelia, Michoacán, Mexico – 5-6 November, 2007

54. **Hadron Physics & DSE Perspective**, presented at the XI Mexican Workshop on Particles and Fields, Tuxtla Gutierrez, Chiapas, Mexico – 7-12 November, 2007

55. **Form Factors: A Dyson-Schwinger Equation Perspective**, presented at the Workshop on Hadron Electromagnetic Form Factors, ECT* Trento, Italy – 12-23 May 2008

56. **Hadron Form Factors**, presented at the 2008 Annual Users' Group Meeting, JLab, Newport News, VA – 16-18 June 2008

57. **Hadron Form Factors & DSEs**, presented at Light Cone 2008: Relativistic Nuclear and Particle Physics, European Physical Society Mulhouse, France – 7-11 July 2008

58. **Poincaré covariant studies of mesons and baryons**, presented at the Electromagnetic N-N* Transition Form Factors Workshop, JLab, Newport News, VA – 13-15 October 2008

59. **Charting the long-range interaction between light-quarks**, presented at CLAS12 European Workshop, Genova, Italy – February 25-28, 2009

4.7 Invited Lecture Series

1. Series of 2 lectures entitled "*Low Energy Hadron Phenomena*" and "*From a gluon propagator to hadronic observables*" at the Research Workshop on Non-perturbative Methods in Field Theory, National Centre for Theoretical Physics, Australian National University, 1-17 May, 1995.

2. Series of 5 Lectures entitled "*Dyson-Schwinger Equations: Dynamical Chiral Symmetry Breaking, and Hadron Observables*" presented at the 16th UK Institute for Theoretical High Energy Physicists, Swansea, Wales, 4-8 Sept., 1995.

3. Series of 3 Lectures entitled "*Dyson-Schwinger Equations: Dynamical Chiral Symmetry Breaking, and Hadron Observables*" presented at the Graduiertenkolleg: "Struktur und Wechselwirkung von Hadronen und Kernen", University of Tübingen, Sept. 29 - Oct. 4, 1995.

4. Series of 3 Lectures entitled "*Dyson-Schwinger equations in QED and QCD*" presented at the International School on Light-Front Quantization and Non-Perturbative QCD, sponsored by the International Institute of Theoretical and Applied Physics, Ames, IA, May 6 - June 2, 1996.

5. Series of 3 Lectures entitled "*Hadron Physics: Nonperturbative Effects in QCD*" presented at the 13th Summer School in Nuclear and Particle Physics, Robertson, NSW, Australia, 9-14 Feb. 1997.

6. Series of 5 Lectures entitled "*Nonperturbative effects in QCD at finite temperature and density*" presented at the Research Workshop on Deconfinement at Finite Temperature and Density, Dubna, Russia, 1-25 Oct. 1997.

7. Series of 3 Lectures entitled "*Nonperturbative QCD with Modern Tools*", presented at the 11th Physics Summer School, National Centre for Theoretical Physics, Australian National University, Canberra, ACT, Australia, 12-23 Jan. 1998.

8. Series of 2 Lectures entitled "*Nonperturbative QCD with Modern Tools*", presented in the *Graduiertenkolleg* on Particle- and Astro-physics, University of Rostock, Rostock, Germany, 10-28 Apr. 2000

9. Series of 2 Lectures entitled "*Unifying light- and heavy-quark physics*, presented at the International School on Heavy-Quark Physics, Bogoliubov Laboratory for Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia, 27/May-5/Jun./2002

10. Series of 5 Lectures entitled *Hadron Physics and Dyson-Schwinger Equations*, presented at the 20th Annual Hampton University Graduate Studies Program, JLab, Newport News, VA, 31/May-17/Jun. 2005

11. Series of 3 Lectures entitled *Dyson-Schwinger Equations: From Gluons and Quarks to Reality*, presented at the Helmholtz International School on Heavy Quark Physics, Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, 6-16 June, 2005

12. Series of 4 Lectures entitled *Aspects of Hadron Physics*, presented at the 44th International University for Theoretical Physics: Hadron Structure and Nonperturbative QCD, Schladming, Austria, 11-18 March, 2006.

13. Series of 4 lectures entitled *Hadron Physics from Dyson-Schwinger Equations* presented at the Workshop on Dyson-Schwinger equations and their applications, Physics Department, Peking University, Beijing, China – August 14-18, 2007

14. Series of 2 lectures entitled *Modern Hadron Physics* presented at the Zhongshan Forum, Physics Department, Nanjing University, Nanjing, China – 24-26 June 2008

15. Series of 4 lectures entitled *Dyson-Schwinger Equations and QCD* presented at the 25th Student's Workshop on Electromagnetic Interactions, Bosen (Saar) Germany – 31 August - 5 September 2008