

## ***UDAY SUKHATME***

Present Position: Executive Vice Chancellor and Dean of the Faculties  
Indiana University-Purdue University Indianapolis

Office Address: Office of the Executive Vice Chancellor Dean of the Faculties  
IUPUI, 355 N. Lansing, AO 126,  
Indianapolis, Indiana 46202

### **Higher Education**

Massachusetts Institute of Technology, Cambridge, Massachusetts; Sc.D. Physics, 1971  
Massachusetts Institute of Technology, Cambridge, Massachusetts; S.B. Physics, 1966  
University of Delhi, India; B.Sc. Mathematics (Honors), 1964

### **Professional Positions**

IUPUI, Executive Vice Chancellor and Dean of the Faculties	2006 - now
IUPUI, Professor of Physics	2006 - now
State University of New York at Buffalo, Dean of the College of Arts and Sciences	2002 - 2006
State University of New York at Buffalo, Professor of Physics	2002 - 2006
University of Illinois at Chicago, Interim Vice Provost for Academic Programs	2000 - 2002
University of Illinois at Chicago, Associate Vice Chancellor for Academic Affairs	1998 - 2000
University of Illinois at Chicago, Head, Department of Physics	1991 - 1998
University of Illinois at Chicago, Professor of Physics	1989 - 2002
University of Illinois at Chicago, Associate Professor of Physics	1985 - 1989
University of Illinois at Chicago, Assistant Professor of Physics	1980 - 1985
Iowa State University, Ames, Iowa, Visiting Associate Professor of Physics	1979 - 1980
Université de Paris XI, LPTPE, Orsay, France; IN2P3 CNRS chercheur	1977 - 1979
Cambridge University, DAMTP, Cambridge, England; postdoctoral fellow	1975 - 1977
University of Michigan, Department of Physics, Ann Arbor, Michigan; postdoctoral scholar	1973 - 1975
University of Washington, Department of Physics, Seattle, Washington; postdoctoral fellow	1971 - 1973
Massachusetts Institute of Technology, Cambridge, Mass; graduate teaching assistant	1966 - 1971

## **TEACHING:**

- UIC Excellence in Teaching Award, 1996
- Finalist in the UIC Silver Circle Award Selection, 1988
- Supervised the thesis research of 3 doctoral and 3 master's students. Constantin Rasinariu's doctoral thesis "Some Aspects of Supersymmetry and Integrable Systems" won UIC's Outstanding Thesis Award in 1999.

## **Courses Taught at University of Illinois at Chicago (1980-2002):**

LAS 100	Freshman Seminar: Introduction to University Study
Phys. 099/100	Introduction to the General Physics Sequences
Phys. 101 - 103	Introductory Physics Sequence (algebra-based)
Phys. 141 - 143, 244	General Physics Sequence (calculus based)
Phys. 366 - 367	Mathematical Methods of Theoretical Physics
Phys. 411 - 413	Quantum Mechanics
Phys. 414	Quantum Field Theory
Phys. 401 - 403	Electrodynamics
Phys. 435 - 436	Elementary Particle Physics
Phys. 498	Special Topic: Solitons and Nonlinear Evolution Equations
Phys. 594	Special Topic: Supersymmetric Quantum Mechanics

## **RESEARCH:**

**High Energy Phenomenology:** The most common method of studying the basic structure of elementary particles is to make them collide at very high energies and study the properties of the outgoing products. In most events, the produced hadrons are "soft" and essentially move along the collisions axis. In 1982, my collaborators and I developed the dual parton model [DPM] for soft collisions. This model is based on the dual topological unitarization scheme (which advocates the dominance of topologically simple processes at high energies) and the parton structure of quantum chromodynamics. DPM has been thoroughly tested by many authors and has provided a very successful overall description of the extensive experimental data on soft multiparticle production. DPM can explain rising rapidity plateaus, long range correlations, violations of KNO scaling, inclusive rapidity and charge distributions in both hadronic and nuclear collisions. DPM and Monte Carlo generators based on it are widely used in the literature. My collaborators and I have written a detailed review article on DPM, which is published in Physics Reports, and has received over 300 citations. Also, my collaborators and I have studied the differences in the structure functions of quarks and gluons in hadrons and nuclei in the framework of the quark cluster model. Applications of these ideas to the EMC effect and direct photon and di-muon production in hadron-nucleus collisions have been made.

**Supersymmetric Quantum Mechanics:** This second area of research was a very profitable offshoot of my earlier work on large N expansions in quantum mechanics, where N is the number of spatial dimensions. The recent application of supersymmetry ideas to nonrelativistic quantum mechanics has led to the revival and improvement of

several known techniques for handling the eigenvalue problem. This has yielded a deeper understanding of existing results and a large number of new results. In particular, (i) the connection between analytically solvable potentials and shape invariance is better understood; (ii) the construction of multi-parameter families of isospectral Hamiltonians is possible; (iii) one can substantially improve established approximation techniques like the semiclassical WKB approximation and large N expansions; (iv) it is possible to obtain a convergent, systematic expansion to compute the energy splitting [rate of tunneling] in a double well potential which is superior to the usual WKB formula. I have studied the connection between supersymmetric quantum mechanics, the KdV hierarchy of nonlinear, soliton-bearing differential equations, integrable models and conformal field theories. Other projects include: (i) the study of singular superpotentials; (ii) obtaining general families of potentials which permit the existence of normalizable bound state eigenfunctions in the classical continuum; (iii) application of supersymmetric quantum mechanics techniques to periodic potentials. My collaborators and I have written a detailed review article and a graduate level textbook on supersymmetric quantum mechanics, both heavily cited in the literature. We have applied supersymmetric quantum mechanics to periodic potentials and have discovered exciting new cyclic identities and Landen transformations for Jacobi elliptic functions. One of the most widely used reference books in theoretical physics and applied mathematics is the “Handbook of Mathematical Functions” by M. Abramowitz and I. Stegun. In the new edition, four subsections are devoted to cyclic identities for Jacobi elliptic functions discovered by me and my collaborators.

**Grant Support:**

UIC Research Board	\$ 2,000	1981-82
U.S. Department of Energy	\$ 46,000	1983-86
Research Corporation (Cottrell Grant)	\$ 7,300	1983-88
U.S. Department of Energy (with W.Y. Keung)	\$ 247,000	1986-89
U.S. Department of Energy (with W.Y. Keung, H. Aratyn)	\$ 95,000	1989-90
U.S. Department of Energy (with W.Y. Keung, H. Aratyn)	\$ 102,000	1990-91
United Nations Development Program	\$ 5,000	1991-92
U.S. Department of Education, Minority Science Improvement Program (with B. Abayomi, P. Jawaid)	\$ 20,000	1991-92
U.S. Department of Energy (with W.Y. Keung, H. Aratyn)	\$ 320,000	1991-94
U.S. Department of Energy (with W.Y.Keung, H. Aratyn, T.Imbo)	\$ 410,000	1994-97
U.S. Department of Energy (with W.Y.Keung, T.Imbo)	\$ 390,000	1997-00
U.S. Department of Energy (with W.Y.Keung, T.Imbo)	\$ 405,000	2000-04
NSF Alliance for Minority Participation (with 8 Illinois universities)	\$2,500,000	2001-06
International Centre for Theoretical Physics (Trieste) Visiting Scholar Program	\$ 2,500	2002-05

**Invited Review Talks at International Conferences, Workshops, Meetings:**

1. XII Rencontre de Moriond, Flaine, France 1977.
2. XIII Rencontre de Moriond, Les Arcs, France 1978.
3. XIV Rencontre de Moriond, Les Arcs, France 1979.
4. "Dual Topological Unitarization" Workshop, Berkeley, CA 1980.
5. "Physics Opportunities at the Tevatron" Workshop, Fermilab, Batavia, IL 1980.
6. Europhysics Study Conference, Erice, Sicily 1981.
7. XII International Symposium on Multiparticle Dynamics, Notre Dame, IN 1981.
8. Workshop on "A<sup>α</sup> Physics", Fermilab, Batavia, IL 1982.
9. XIII International Symposium on Multiparticle Dynamics, Volendam, Holland 1982.
10. VII Warsaw Symposium on Elementary Particle Physics, Kazimierz, Poland 1984.
11. Elastic and Diffractive Scattering Conference, Blois, France 1985.
12. XVI International Symposium on Multiparticle Dynamics, Kiryat Anavim, Israel 1985.
13. XXI Rencontre de Moriond, Les Arcs, France 1986.
14. XIV International Symposium on Multiparticle Dynamics, Arles, France 1988.
15. IX High Energy Physics Symposium, Madras, India 1988.
16. XIII Warsaw Symposium on Elementary Particle Physics, Kazimierz, Poland 1990 – conference summary.
17. Workshop on High Energy Physics Phenomenology, Calcutta, India 1991.
18. XXII International Symposium on Multiparticle Dynamics, Santiago de Compostela, Spain 1992.
19. X High Energy Physics Symposium, Bombay, India 1992.
20. V Blois Workshop on Elastic and Diffractive Scattering, Providence, RI 1993.
21. Workshop on Quantum Infrared Physics, Paris, France 1994.
22. XI High Energy Physics Symposium, Santiniketan, India 1995.
23. "Supersymmetry and Integrable Models" Workshop, UIC, Chicago 1997.
24. "Integrable Hierarchies and Modern Physical Theories" Workshop, UIC, Chicago 2000.
25. XXIII International Colloquium on Group Theoretical Methods in Physics, Dubna, Russia 2000.
26. XIV DAE Symposium on High Energy Physics, Hyderabad, India, December 2000.
27. Conference on "Progress in Supersymmetric Quantum Mechanics", Valladolid, Spain, July 2003.

**Referee Work:**

American Journal of Physics, Annals of Physics, Astroparticle Physics, Canadian Journal of Physics, Europhysics Letters, Journal of Mathematical Physics, Journal of Physics, Modern Physics Letters A, Nuclear Physics, Physical Review A, Physical Review D, Physical Review Letters, Physica Scripta, Physics Letters A, Physics Letters B, Pramana, Turkish Journal of Physics, Zeitschrift fur Physik.

**List of Publications** (Uday P. Sukhatme):

[13 of the publications listed below are in the top-cited category (more than 50 citations) in citation databases; 6 publications have 50 to 150 citations, 4 publications have 150 to 250 citations, and 3 have more than 250 citations. Publication number 77 was included in the list of “most memorable papers” compiled by the American Journal of Physics in 1994.]

1. Exact Consequences of Broken  $O(4)$  Symmetry III. Factorization and Mass Dependence (with J.B. Bronzan), Phys. Rev. D3, 2506 (1971).
2. Dual Resonance Amplitudes for Spinning Particles (with C. Rosenzweig), Nuovo Cimento 3A, 511 (1971).
3. Scattering Amplitudes for Physical States in Dual Resonance Models (with K. Friedman and C. Rosenzweig), Lett. Nuovo Cimento 1, 1109 (1971).
4. Dual N-Pion Amplitude, Lett. Nuovo Cimento 3, 537 (1972).
5. Triple-Regge Vertex in a Dual Resonance Model with Nonlinear Trajectories, Phys. Rev. D6, 2765 (1972).
6. Factorizable Dual Resonance Models Without Tachyons (with S. Yu), Lett. Nuovo Cimento 5, 513 (1972).
7. Universal Curve for Meson-Nucleon Elastic Scattering (with S. Blaha and W. Pardee), Phys. Lett. B42, 435 (1972).
8. Duality and Proton-Proton Scattering at All Angles (with D. Coon and J. Tran Thanh Van), Phys. Lett. B45, 287 (1973).
9. Gribov's Reggeon Calculus and High Energy Elastic Proton-Proton Scattering (with J.N. Ng), Nucl. Phys. B55, 253 (1973).
10. WKB Energy Levels for a Class of One Dimensional Potentials, Amer. Jour. Phys. 41, 1015 (1973).
11. Consistency of New Meson-Nucleon Elastic Scattering Data with a Previously Conjectured Universal Curve (with S. Blaha), Phys. Rev. D8, 4221 (1973).
12. High Energy pp Data and the Reggeon Theory of Diffraction Scattering (with J. N. Ng), Nucl. Phys. B70, 229 (1974).
13. Multiperipheral and Diffractive Components of the Total Cross Section in Gribov's Reggeon Calculus (with C. Pajares), Phys. Rev. D9, 2119 (1974).
14. Test of a Generalized Chou-Yang Model at Currently Available High Energies (with F. Hayot), Phys. Rev. D10, 2183 (1974).
15. Interpreting Data from Polarized Proton Beams (with G.L. Kane), Nucl. Phys. B78, 110 (1974).
16. Obtaining Real Parts of Scattering Amplitudes Directly from Cross Section Data Using Derivative Analyticity Relations (with J.B. Bronzan and G.L. Kane), Phys. Lett. B49, 272 (1974).
17. An Improvement of Gribov's Reggeon Calculus (with F. Henyey), Nucl. Phys. B85, 39 (1975).

18. Real Parts of Forward Elastic Hadronic Amplitudes (with D. Sidhu), Phys. Rev. D11, 1351 (1975).
19. Extension of the Chou-Yang Model to Multiparticle Processes (with F. Henyey), Nucl. Phys. B89, 287 (1975).
20. Extensions of the Derivative Dispersion Relations for Amplitude Analysis (with G. L. Kane, R. Blankenbecler and M. Davier), Phys. Rev. D12, 3431 (1975).
21. A Hadronic Interpretation of  $\psi'$  and  $\psi$  Decays (with F. Henyey and G. L. Kane), Univ. of Michigan Report 75-13 (1975).
22. The Origin of Jets at Large- $p_T$  (with J. Gasser), Cambridge Univ. report DAMTP 76/3 (1976).
23. Unitarity Bounds on Diffraction Dissociation (with F. Henyey), Nucl. Phys. B108, 317 (1976).
24. The Size of Inelastic Diffraction Dissociation, Phys. Lett. B65, 151 (1976).
25. Fixed Regge Singularities in Exclusive Pion Photoproduction (with J. C. Polkinghorne), Phys. Rev. D15, 3252 (1977).
26. Where is the Dip Structure in pp Elastic Scattering?, Phys. Rev. Lett. 38, 124 (1977).
27. Some New Aspects of High Energy pp Elastic Scattering, Invited paper in Proc. XII Rencontre de Moriond, Flaine, France 1977, edited by J. Tran Thanh Van.
28. Quark Jets: A Quantitative Description, Cambridge Univ. report DAMTP 77/25 (1977).
29. Jets from Quark Fragmentation: Treatment of Flavor and New Power Counting Rules at  $x \rightarrow 1$ , Phys. Lett. B73, 478 (1978).
30. Eccentricity of Jet Angular Distributions: A Technique for Detecting New Quark Flavors (with J. Tran Thanh Van), Phys. Lett. B76, 489 (1978).
31. Quark Jets, Invited paper in Proc. XIII Rencontre de Moriond, Les Arcs, France 1978, edited by J. Tran Thanh Van.
32. Elastic Peak and Hadron Size from a t-Channel Viewpoint (with Chung-I Tan and J. Tran Thanh Van), Zeit. Phys. C1, 95 (1979).
33. Jets in Small- $p_T$  Hadronic Collisions, Universality of Quark Fragmentation, and Rising Rapidity Plateaus (with A. Capella, Chung-I Tan and J. Tran Thanh Van), Phys. Lett. B81, 68 (1979).
34. Gluon and Quark Jets in a Recursive Model Motivated by QCD, Zeit. Phys. C2, 321 (1979).
35. Does a Nucleus Act Like a Gluon Filter? (with A. Krzywicki, J. Engels and B. Petersson), Phys. Lett. B85, 407 (1979).
36. A Survey of Low- $p_T$  Hadronic Collisions from a Partonic Viewpoint, Invited paper in Proc. XIV Rencontre de Moriond, Les Arcs, France 1979, edited by J. Tran Thanh Van.
37. Universality of Quark Fragmentation (with A. Capella, Chung-I Tan and J. Tran Thanh Van), Proc. XIV Rencontre de Moriond, Les Arcs, France 1979, edited by J. Tran Thanh Van.

38. Soft Multihadron Production from Partonic Structure and Fragmentation Functions (with A. Capella and J. Tran Thanh Van), *Zeit. Phys.* C3, 329 (1980).
39.  $Q^2$ -Evolution of Multihadron Fragmentation Functions (with K. Lassila), *Phys. Rev.* D22, 1184 (1980).
40. A Parton Description of Soft Proton-Antiproton Annihilation, *Phys. Rev. Lett.* 45, 5 (1980).
41. The Importance of Diquark and Gluon Jet Experiments, in "Physics Opportunities for the Fixed-Target Tevatron", Fermilab 1980, edited by G. L. Kane and N. Gelfand.
42. Constraints from Jet Calculus on Quark Recombination (with L. Jones, K. Lassila and D. Willen), *Phys. Rev.* D23, 717 (1981).
43. Understanding Inclusive  $pp \rightarrow ph^{\pm}X$  Data with Parton Fragmentation and Structure Functions (with A. Ng and K. Lassila), *Phys. Rev.* D24, 784 (1981).
44. Models for Color Jets and Fragmentation Functions, invited lectures at Europhysics Conference on "Partons in Soft Hadronic Processes", Erice, Sicily (1981), edited by R. Van de Walle.
45. Diquark Jets, in Proc. XII International Symposium on Multiparticle Dynamics, Notre Dame, Indiana (1981), edited by W.D. Shephard and V. Kenney.
46. Diquark Fragmentation (with K. Lassila and R. Orava), *Phys. Rev.* D25, 2975 (1982).
47. The Best Method for Identifying the Jet-Initiating Parton, *Phys. Lett.* B113, 185 (1982).
48. Particle Production at Large Transverse Momentum in Nucleus-Nucleus Collisions (with G. Wilk), *Phys. Rev.* D25, 1978 (1982).
49. Charge Distributions in Hadronic Collisions (with A. Pagnamenta), *Zeit. Phys.* C14, 79 (1982).
50. A Parton Approach to Peaks at Large  $x$  in Diffractive Inclusive Reactions (with B. Desai), Univ. of California at Riverside report UCR-82-3 (1982).
51. Anomalous Nuclear Enhancement and Gluon Filters, in Proc. Workshop on  $A^{\alpha}$  Physics, Fermilab, Batavia, Illinois (1982), Fermilab report 82/29-THY/EXP, edited by L. Voyvodic.
52. Quark and Diquark Fragmentation and Recombination in Lepton-Lepton, LeptonHadron and Hadron-Hadron Collisions, invited review talk in Proc. XIII International Symposium on Multiparticle Dynamics, Volendam, The Netherlands (1982), edited by W. Kittel, W. Metzger and A. Stergiou.
53. Two Particle Inclusive Distributions in the Dual Parton Model (with A. Capella and J. Tran Thanh Van), *Phys. Lett.* B119, 220 (1982).
54. Evidence for "Held Back" Valence Quarks from Particle Ratios in  $pp$  and  $p$  Collisions (with A. Capella and J. Tran Thanh Van), *Phys. Lett.* B125, 330 (1983).
55. Shifted  $1/N$  Expansions for Energy Eigenvalues of the Schrödinger Equation (with T. Imbo), *Phys. Rev.* D28, 418 (1983).
56. Logarithmic Perturbation Expansions in Non-Relativistic Quantum Mechanics (with T. Imbo), *Amer. Jour. Phys.* 52, 140 (1984).

57. A Low  $p_T$  Parton Fragmentation Model with Diffractive Resonance Production: The  $pp \rightarrow (\pi^\pm, K^\pm) + X$  Inclusive Reactions (with B. Desai), *Zeit. Phys.* C24, 277 (1984).
58. Energy Eigenstates of Spherically Symmetric Potentials Using the Shifted  $1/N$  Expansion (with T. Imbo and A. Pagnamenta), *Phys. Rev.* D29, 1669 (1984).
59. Bound States of the Yukawa Potential Via the Shifted  $1/N$  Expansion (with T. Imbo and A. Pagnamenta), *Phys. Lett.* A105, 183 (1984).
60. Do Certain Nondiffractive Interactions Have Forward Peaks? (with B. Lauer), Univ. of Illinois at Chicago report UIC-84-10 (1984).
61. Shifted Large  $N$  Expansions in Quantum Mechanics, invited talk in Proc. VII Warsaw Symposium on Elementary Particle Physics, Kazimierz, Poland (1984), edited by Z. Ajduk.
62. Improved Wave Functions for Large  $N$  Expansions (with T. Imbo), *Phys. Rev.* D31, 2655 (1985).
63. The Pomeron Story (with Chung-I Tan, A. Capella and J. Tran Thanh Van) in "A Passion for Physics: Essays in Honor of Geoffrey Chew", edited by C. DeTar, J. Finkelstein, Chung-I Tan, World Scientific Publishing (1985).
64. Supersymmetric Quantum Mechanics and Large  $N$  Expansions (with T. Imbo), *Phys. Rev. Lett.* 54, 2184 (1985).
65. Odderon Effects in the Dual Parton Model, in Proc. of the Workshop on Elastic and Diffractive Scattering at the Collider and Beyond, Blois, France (1985), edited by B. Nicolescu and J. Tran Thanh Van.
66. Soft Hadronic Collisions -- A Theoretical Review, invited review talk in Proc. XVI International Symposium on Multiparticle Dynamics, Kiryat-Anavim, Israel (1985), edited by J. Grunhaus.
67. Potential Scattering and Large- $N$  Expansions (with B. Lauer and T. Imbo), *Phys. Rev.* D33, 116 (1986).
68. Conditions for Non-Degeneracy in Supersymmetric Quantum Mechanics (with T. Imbo), *Phys. Rev.* D33, 3147 (1986).
69. Quantum Mechanical Applications of the Large  $N$  Method, Proc. XXI Rencontre de Moriond, Les Arcs, France 1986, edited by J. Tran Thanh Van.
70. Explicit Mass Formulae for Heavy Mesons and Baryons (with A. Pagnamenta), *Phys. Rev.* D34 3528 (1986).
71. Exactness of Supersymmetric WKB Spectra for Shape Invariant Potentials (with R. Dutt and A. Khare), *Phys. Lett.* B181, 295 (1986).
72. Hadron Cross Sections at Ultra High Energies and Unitarity Bounds on Diffraction (with T.K. Gaisser and G.B. Yodh), *Phys. Rev.* D36, 1350 (1987).
73. The  $1/N$  Expansion and Nonrelativistic Potential Problems with Several Expansion Parameters -- Applications to the Rotating Harmonic Oscillator, Zeeman Effect and Helium-Like Atoms (with R. Dutt and T. Imbo), *Zeit. Phys.* D6, 211 (1987).
74. Delayed Thresholds and Heavy Flavor Production in the Dual Parton Model (with A. Capella, Chung-I Tan and J. Tran Thanh Van), *Phys. Rev.* D36, 109-113 (1987).

75. Some Recent Applications of Schrödinger's Factorization Method and Supersymmetric Quantum Mechanics (with R. Dutt and A. Khare), contributed paper to the Schrödinger Centenary Conference, London, England (1987).
76. Dual Parton Model (with A. Capella, Chung-I Tan, J. Tran Thanh Van), in "Hadronic Multiparticle Production", edited by P.A. Carruthers, World Scientific Publishing (1987).
77. Supersymmetry, Shape Invariance and Exactly Solvable Potentials (with R. Dutt and A. Khare), Amer. Jour. Phys. 56, 163 (1988).
78. Supersymmetry and Double Well Potentials (with W.Y. Keung and E. Kovacs), Phys. Rev. Lett. 60, 41 (1988).
79. Higher Order WKB Approximations in Supersymmetric Quantum Mechanics (with R. Adhikari, R. Dutt and A. Khare), Phys. Rev. A38, 1679 (1988).
80. Explicit Wave Functions for Shape Invariant Potentials by Operator Techniques (with J. Dabrowska and A. Khare), Jour. Phys. A21, L195 (1988).
81. Scattering Amplitudes for Supersymmetric Shape Invariant Potentials by Operator Methods (with A. Khare), Jour. Phys. A21, L501 (1988).
82. The EMC Effect at All  $x$  in the Quark Cluster Model (with K. Lassila), Phys. Lett. B209, 343 (1988).
83. Quark Clusters in Nuclei (with K. Lassila), Proc. XIX International Symposium on Multiparticle Dynamics, Arles, France (1988), edited by D. Schiff and J. Tran Thanh Van.
84. Reactions Probing Effects of Quark Clusters in Nuclei (with K. Lassila), Proc. Workshop on "Nuclear and Particle Physics on the Light Cone", Los Alamos (1988), edited by M. Johnson and L. Kisslinger (World Scientific, Singapore) p. 115.
85. W-Boson Associated Multiplicity and the Dual Parton Model (with A. Capella, Chung-I Tan and J. Tran Thanh Van), Brown Univ. report HET/644 (1988) and Proc. Am. Phys. Soc. Particles and Fields Meeting, Storrs, Conn., edited by K. Haller (1988).
86. Dual Parton Model for Soft Hadronic Collisions, Invited review talk in Proc. IX High Energy Physics Symposium, Madras, India (1988), edited by R. Parthasarathy and H. Sharatchandra.
87. Phase Equivalent Potentials Obtained from Supersymmetry (with A. Khare), Jour. Phys. A22, 2847 (1989).
88. Nuclear Effects in the Hadroproduction of Charm (with P. Hoyer, B.P. Mahapatra and K. Sridhar), "Phenomenology of the Standard Model and Beyond", Proc. Workshop on High Energy Physics Phenomenology, TIFR, Bombay (1989), edited by D.P. Roy and P. Roy, p. 173.
89. Families of Strictly Isospectral Potentials (with W.Y. Keung, Q.M. Wang and T. Imbo), Jour. Phys. A22, L987 (1989).
90. Countable Infinity of Isospectral Potential Families (with A. Khare), Phys. Rev. A40, 6185 (1989).
91. Solitons from Supersymmetry (with Q.M. Wang, W.Y. Keung and T. Imbo), Modern Phys. Lett. A5, 525 (1990).

92. Covariant Operators and Higher Spin Conformal Algebras (with Q.M. Wang, P. Panigrahi and W.Y. Keung), Nucl. Phys. B344, 196 (1990).
93. Violation of Factorization in Charm Hadroproduction (with P. Hoyer and M. Vanttinen), Phys. Lett. B246 (1990).
94. Multiquark Effects and Multiquark Fragmentation (with K. Lassila, A. Petridis and C. Carlson), Proc. Am. Phys. Soc. Particles and Fields Meeting, Rice University, Houston, Texas, edited by W. Bonner and H. E. Miettinen (1990).
95. Small-x Shadowing in Dimuon Production (with K. Lassila), Univ. of Illinois at Chicago report UICHEP-TH/90-8 (1990).
96. Supersymmetric Quantum Mechanics (with A. Khare), Physics News 22, 35 (1991).
97. Non-Divergent Semiclassical Wave Functions in Supersymmetric Quantum Mechanics (with A. Pagnamenta), Phys. Lett. A151, 7 (1990).
98. Charge Distributions in the Dual Parton Model, Proc. XIII Warsaw Symposium on Elementary Particle Physics, Kazimierz, Poland, edited by Z. Ajduk (World Scientific, Singapore, 1990).
99. Strong Interaction Physics, Conference summary talk in Proc. XIII Warsaw Symposium on Elementary Particle Physics, Kazimierz, Poland, edited by Z. Ajduk, (World Scientific, Singapore, 1990).
100. Analog of the EMC Effect in Neutrino-Nucleus Interactions (with K. Lassila), International Jour. Mod. Phys. A6, 613 (1991).
101. Supersymmetry Inspired WKB Approximation in Quantum Mechanics (with R. Dutt and A. Khare), Amer. Jour. Phys. 59, 723 (1991).
102. Finite Eigenfunctions in the WKB Approximation (with A. Pagnamenta), Amer. Jour. Phys. 59, 944 (1991).
103. Dilepton Production by Protons on Nuclei and the Partonic Origin of Depletion at Small Momentum Fraction (with K. Lassila, A. Harindranath and J. Vary), Phys. Rev. C44, 1188 (1991).
104. Backward Hadrons from Deep Inelastic Lepton Scattering on Nuclei (with C.E. Carlson and K. Lassila), Phys. Lett. B263, 277 (1991).
105. Deep Inelastic Processes with Backward Hadrons (with C.E. Carlson and K. Lassila), Proc. 4th Conference on the Interactions between Particle and Nuclear Physics, Tucson, Arizona (1991).
106. Evidence for Six-Quark Clusters in QCD Processes (with A. Petridis, C.E. Carlson and K. Lassila), Proc. Am. Phys. Soc. Meeting, Vancouver, Canada (1991).
107. Gluon Structure Functions in Nuclei from the Quark Cluster Model (with G. Wilk and K. Lassila), Zeit. Phys. C53, 439 (1992).
108. Alternative Approach to Nonrelativistic Perturbation Theory (with Il-Woo Kim), Jour. Phys. A25, L647 (1992).
109. Mapping of Shape Invariant Potentials Under Point Canonical Transformations (with R. De and R. Dutt), Jour. Phys. A25, L843 (1992).

110. Shadowing of the Gluon in Fixed Target Experiments (with K. Lassila, A. Petridis, G. Wilk), Phys. Lett. B297, 191 (1992).
111. Path-Integral Solutions for Shape Invariant Potentials Using Point Canonical Transformations (with R. De and R. Dutt), Phys. Rev. A46, 6869 (1992).
112. Singular Superpotentials in Supersymmetric Quantum Mechanics (with P. Panigrahi), Phys. Lett. A178, 251 (1993).
113. Supersymmetry and Tunneling in an Asymmetric Double Well (with A. Gangopadhyaya and P. Panigrahi), Phys. Rev. A47, 2720 (1993).
114. Bound States in the Continuum from Supersymmetric Quantum Mechanics (with J. Pappademos and A. Pagnamenta), Phys. Rev. A48, 3525 (1993).
115. Solvable Quantum Mechanical Examples of Broken Supersymmetry (with R. Dutt, A. Gangopadhyaya, A. Khare and A. Pagnamenta), Phys. Lett. A174, 363 (1993).
116. Lognormal Multiplicity Distributions and the Dual Parton Model, Proc. XXII International Symposium on Multiparticle Dynamics, Santiago de Compostela, Spain, edited by C. Pajares, (World Scientific, Singapore, 1993), p.201.
117. Semiclassical Approach to Quantum Mechanical Problems with Broken Supersymmetry (with R. Dutt, A. Gangopadhyaya, A. Khare and A. Pagnamenta), Phys. Rev. A48, 1845 (1993).
118. New Shape Invariant Potentials in Supersymmetric Quantum Mechanics (with A. Khare), Jour. Phys. A26, L901 (1993).
119. New Exactly Solvable Hamiltonians: Shape Invariance and Self-Similarity (with D. Barclay, R. Dutt, A. Gangopadhyaya, A. Khare and A. Pagnamenta), Phys. Rev. A48, 2786 (1993).
120. Is the Lowest Order Supersymmetric WKB Approximation Exact for All Shape Invariant Potentials? (with D. Barclay and A. Khare), Phys. Lett. A183, 263 (1993).
121. Dual Parton Model (with A. Capella, C-I Tan and J. Tran Thanh Van), Phys. Reports 236, 225-329 (1994).
122. Analysis of Inverse Square Potentials (with A. Gangopadhyaya and P. Panigrahi), Jour. Phys. A27, 4295 (1994).
123. Thermodynamics of a Free q-Fermion Gas (with R. Dutt, A. Gangopadhyaya and A. Khare), Int. Jour. Mod. Phys A9, 2687 (1994).
124. Inter-Relations of Solvable Potentials (with A. Gangopadhyaya and P. Panigrahi), Helv. Phys. Acta 67, 363 (1994).
125. Relations Among Solvable Potentials of Nonrelativistic Quantum Mechanics (with A. Gangopadhyaya), Proc. Workshop on Symmetries and Integrability of Differential Equations, Montreal, Canada, May 1994.
126. Role of Caustics in Supersymmetric Semiclassical Approach to Path Integrals (with R. De and R. Dutt), Phys. Lett. A191, 352 (1994).
127. Dual Parton Model for Soft Hadronic Collisions, Proc. Workshop on Quantum Infrared Physics, Paris, France, June 1994, edited by H. Fried (World Scientific).

128. Comment on "Conditionally Exactly Soluble Class of Quantum Potentials" (with R. Dutt and A. Gangopadhyaya), University of Illinois at Chicago report 1994.
129. Supersymmetry and Quantum Mechanics (with F. Cooper and A. Khare), Physics Reports 251, 267-388 (1995).
130. Quantum Mechanics of Multi-Prong Potentials (with A. Gangopadhyaya and A. Pagnamenta), Jour. Phys. A28, 5331 (1995).
131. Methods for Generating Quasi-Exactly Solvable Potentials (with A. Gangopadhyaya and A. Khare), Phys. Lett. A208, 261 (1995).
132. Negaton and Positon Solutions of the KdV Equation (with C. Rasinariu and A. Khare), Jour. Phys. A29, 1803 (1996).
133. Potentials with Two Shifted Sets of Equally Spaced Eigenvalues and Their Calogero Spectrum (with A. Gangopadhyaya), Phys. Lett. A224, 5-14 (1996).
134. Structure Functions of Nuclei for All  $x$  and  $Q^2$  (with A.B. Kaidalov and C. Rasinariu), Zeit. Phys.C75, 483-488 (1997).
135. Non-Central Potentials and Spherical Harmonics Using Supersymmetry and Shape Invariance (with R. Dutt and A. Gangopadhyaya), Amer. Jour. Phys. 65, 400-403 (1997).
136. Accuracy of Semiclassical Methods for Shape Invariant Potentials (with M. Hruska and W.Y. Keung), Phys. Rev. A55, 3345-3350 (1997).
137. Book review of "Quantum Mechanics, Classical Results" by Richard W. Robinett, Oxford Univ. Press, Foundations of Physics 27, 957 (1997).
138. Cyclic Shape Invariant Potentials (with C. Rasinariu and A. Khare), Phys. Lett. A234, 401-409 (1997).
139. Shape Invariance and Its Connection to Potential Algebra (with A. Gangopadhyaya, J. Mallow), in "Supersymmetry and Integrable Models", pp. 341-350, Springer-Verlag, ed. H. Aratyn et al. (1998).
140. Cyclic Shape Invariant Potentials (with C. Rasinariu, A. Khare and A. Gangopadhyaya), in "Supersymmetry and Integrable Models", pp. 369-379, Springer-Verlag, ed. H. Aratyn et al. (1998).
141. "Supersymmetry and Integrable Models", Proceedings of the UIC Theory Workshop, June 1997, edited by H. Aratyn, T. Imbo, W.Y. Keung, U. Sukhatme, Springer-Verlag Lecture Notes in Physics 502 (1998).
142. Exact Solution of a Class of Three-Body Scattering Problems in One Dimension (with A. Khare), Phys. Lett. A241, 14-18 (1998).
143. Translational Shape Invariance and Inherent Potential Algebra (with A. Gangopadhyaya and J. Mallow), Phys. Rev. A58, 4287-4292 (1998).
144. Algebraic Shape Invariant Models (with S. Chaturvedi, R. Dutt, A. Gangopadhyaya, P. Panigrahi and C. Rasinariu), Phys. Lett. A248, 109-113 (1998).
145. "Particle Distributions in Hadronic and Nuclear Collisions", Proceedings of a Workshop at UIC, June 1998, edited by M. Adams, R. Betts, T. Imbo, W.Y. Keung, U. Sukhatme, World Scientific (1998).

146. Comment on “Self-Isospectral Periodic Potentials and Supersymmetric Quantum Mechanics” (with A. Khare), Los Alamos e-print quant-ph/9902072 (1999).
147. Exactly Solvable Models in Supersymmetric Quantum Mechanics and Connection with Spectrum Generating Algebras (with A. Gangopadhyaya, J. Mallow and C. Rasinariu), Jour. Theo. Math. Phys. 118, 362-374 (Russian), 285-294 (English) (1999).
148. Coordinate Realizations of Deformed Lie Algebras with Three Generators (with R. Dutt, A. Gangopadhyaya and C. Rasinariu), Phys. Rev. A60, 3482-3486 (1999).
149. Algebraic Shape Invariant Models (with C. Rasinariu and A. Gangopadhyaya), AMS/IP Studies in Advanced Mathematics 13, 449-457 (1999).
150. New Solvable and Quasi Exactly Solvable Periodic Potentials (with A. Khare), Jour. Math. Phys. 40, 5473-5494 (1999).
151. Semiclassical Approximation for Periodic Potentials (with M. Sergeenko), UIC report UICHEP-TH/99-8 (1999).
152. “Supersymmetry in Quantum Mechanics” (with F. Cooper and A. Khare), book published by World Scientific Press, Singapore (2001), 208 pages.
153. New Solvable Singular Potentials (with R. Dutt, A. Gangopadhyaya and C. Rasinariu), Jour. Phys. A34, 4129-4142 (2001).
154. New Solvable Periodic Potentials from Supersymmetry, in “Integrable Hierarchies and Modern Physical Theories”, edited by H. Aratyn and A. Sorin (2001), pp. 329-338, Kluwer Academic Publishers.
155. Supersymmetry and Solvable Periodic Potentials (with A. Khare), in Proc. XXIII International Colloquium on Group Theoretical Methods in Physics, Dubna, Russia, July 2000; Physics of Atomic Nuclei, 65, 1122-1127 (2002) [from Yadernaya Fizika 65,1155-1160 (2002)].
156. Supersymmetry and New Solvable Periodic Potentials, in Proc. XIV DAE Symposium on High Energy Physics, Hyderabad, India, December 2000, ed. A. K. Kapoor.
157. A Forsaken Shape Invariance and New Solvable Singular Potentials (with R. Dutt, A. Gangopadhyaya and C. Rasinariu), in Proc. XIV DAE Symposium on High Energy Physics, Hyderabad, India, December 2000, ed. A. K. Kapoor.
158. Broken Supersymmetric Shape Invariant Systems and Their Potential Algebras (with A. Gangopadhyaya and J. Mallow), Phys. Lett. A283, 279-284 (2001).
159. Some Exact Results for Mid-Band and Zero Band-Gap States of Associated Lamé Potentials (with A. Khare), Jour. Math. Phys. 42, 5652-5664 (2001).
160. Exact Solutions of the Schroedinger Equation: Connection between Supersymmetric Quantum Mechanics and Spectrum Generating Algebras (with A. Gangopadhyaya, J. Mallow and C. Rasinariu), Chinese Jour. Phys. 39, 101 (2001).
161.  $Q^2$ -Dependence of Backward Pion Multiplicity in Neutrino-Nucleus Interactions (with O. Benhar, S. Fantoni and G. Lykasov), Phys. Lett. B527, 73-79 (2002).
162. Linear Superposition in Nonlinear Equations (with A. Khare), Phys. Rev. Letters 88, 244101, pp. 1-4 (2002).

163. Cyclic Identities Involving Jacobi Elliptic Functions (with A. Khare), *Jour. Math. Phys.* 43, 3798-3806 (2002).
164. Periodic Solutions of Nonlinear Equations Obtained by Linear Superposition (with F. Cooper and A. Khare), *Jour. Phys. A: Math. Gen.* 35, 10085-10100 (2002).
165. New Selection Indices for University Admissions: a Quantile Approach (with Mo-Yin Tam and Gilbert W. Bassett Jr.), in "Statistical Data Analysis: Based on the L1-Norm and Related Methods" edited by Yadolah Dodge (2002), pp. 67-76, Birkhäuser, Basel-Boston-Berlin.
166. The Importance of High School Quality in University Admissions Decisions (with Mo-Yin Tam), *College & University*, Vol. 78, 3-8, Winter 2003 edition.
167. Cyclic Identities Involving Jacobi Elliptic Functions. II (with A. Khare and A. Lakshminarayan), arXiv: math-ph/0207019 (2002).
168. A Generalization of Landen's Quadratic Transformation Formulas for Jacobi Elliptic Functions (with A. Khare), arXiv: math-ph/0204054 (2002).
169. Relating Linearly Superposed Periodic Solutions of Nonlinear Equations to One Soliton Solutions (with W. Reinhardt and A. Khare), arXiv: math-ph/0212069 (2002).
170. Hadron Multiplicity in Lepton-Nucleon Interactions (with G. Lykasov and V. Uzhinsky ), *Phys. Lett.* B553, 217-222 (2003).
171. Cyclic Identities for Jacobi Elliptic and Related Functions (with A. Khare and A. Lakshminarayan), *Jour. Math. Phys.* 44, 1822-1841 (2003).
172. Reply to Comment on "Linear Superposition in Nonlinear Equations" (with A. Khare), *Phys. Rev. Lett.* 90, 239402 (2003).
173. Local Identities Involving Jacobi Elliptic Functions (with A. Khare and A. Lakshminarayan), *Pramana* 62, 1201-1230 (2004).
174. Generalized Landen Transformation Formulas for Jacobi Elliptic Functions (with A. Khare), to appear in "Progress in Mathematical Physics", Nova Science Publishers (2004).
175. Analytically Solvable PT-Invariant Periodic Potentials (with A. Khare), *Phys. Lett.* A324, 406-414 (2004).
176. How to Make Better College Admission Decisions: Considering High School Quality and Other Factors (with Mo-Yin Tam), *Journal of College Admission*, Spring issue, 12-16 (2004).
177. Periodic Potentials and Supersymmetry (with A. Khare), *Jour. Phys.* A37, 10037-10055 (2004).
178. Cyclic Identities Involving Ratios of Jacobi Theta Functions (with A. Khare and A. Lakshminarayan), arXiv: math-ph/0403051 (2004).
179. Connecting Jacobi Elliptic Functions with Different Modulus Parameters (with A. Khare), *Pramana* 63, 1-16 (2004).
180. PT-Invariant Periodic Potentials with a Finite Number of Band Gaps (with A. Khare), to appear in *Jour. Math. Phys.* (2005).

181. Quasi-Periodic Solutions of Heun's Equation (with A. Khare), arXiv: math-ph/0505077 (2005).

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