



## **CURRICULUM VITAE**

(updated July, 2019)

**Name :** Professor R. RAJARAMAN

**Date of Birth :** 11 March 1939

**Education :**

**B.Sc. (Hons):** St. Stephens College, Delhi University (1958)

**Ph.D.:** Cornell University, U.S.A. (Jan 1963)

**Thesis Guide:** Nobel Laureate Prof. Hans A. Bethe

**Research Interests**

**A. Theoretical Physics:**

**High Energy Physics, Nuclear theory, Quantum Field Theory,  
Soliton physics, Statistical Mechanics and Quantum Hall systems**

**B. Public Policy:**

**Nuclear Disarmament, Civilian Nuclear Energy,  
Higher Education and Science Policy**

**Present position :**

**Emeritus Professor  
School of Physical Sciences  
Jawaharlal Nehru University  
New Delhi 110067, INDIA**

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[doug1968@hotmail.com](mailto:doug1968@hotmail.com)

Website: <http://jnu.ac.in/Faculty/rajaraman/cv.pdf>

**Past Positions held:**

1. Research Associate, Cornell University, ( 1963-1964)
2. Assistant Professor, Cornell University, USA (1964-1965)
3. Assistant Professor, University of S. California, (1965-1967)
4. Member, Institute for Advanced Study, Princeton, USA (1967-1969)
5. Reader, Delhi University, India (1969-1976)
6. Member, Institute for Advanced Study, Princeton, USA (1973-1975)  
(a second appointment, on leave from Delhi University)
7. Professor, Indian Institute of Science, Bangalore (1976 - 1993)
8. MSIL Endowed Chair, Indian Institute of Science, Bangalore, (1991-93)
9. Professor of Theoretical Physics, Jawaharlal Nehru University, New Delhi  
(1993- 2004)
10. Emeritus Professor, Jawaharlal Nehru University, New Delhi (2004-  
present)

**Some Visiting positions on leave from India**

1. Member, Institute for Advanced Study, Princeton, USA. 1973-75 (leave  
from D.U.)

2. Visiting Scientist, Massachusetts Institute of Technology, (U.S.A.) (Sept-Oct 1979)
3. Visiting Scientist, Harvard University, (U.S.A.) (Nov - Dec 1979)
4. Visiting Professor, University of California, Berkeley, (U.S.A.) (1974 summer)
5. Visiting Professor, Stanford University, (U.S.A.) (Entire Spring semester, 1985)
6. Visiting Scientist, M.I.T. and Harvard University, (U.S.A) (Entire Fall semester 1984-1985)
7. CERN Associate, European Centre for Nuclear Research , Geneva (June-Dec, 1985)
8. Visiting Professor, University of Illinois, Urbana, (U.S.A.), Full academic year 1992-93.
9. Visiting Scientist, Fermi National Accelerator Lab, U.S.A. (June- Aug 1993)
10. University of Melbourne (Leverhulme Fellow, 1973, Visiting Professor 1981 and 1989)
11. Senior Associate of the International Centre for Theoretical Physics, Trieste, Italy  
(3 successive terms, by invitation. 1979-83, 1984-88, 1989-93)
12. Visiting Research Scholar, Princeton University, USA  
May-July 2000, 2002, 2003, 2004, June-July of 2005, 2006, 2007, 2008 and 2009

### Awards and Recognitions

1. The 2014 Leo Szilard Award, American Physical Society, USA
2. Elected Co-chair of the International Panel on Fissile Materials (2008-2014)

3. Elected Member of the Asia Pacific Leadership Network (2012- present)
4. Council Member of the Pugwash Conference on Science & World Affairs (2013-2018)
5. Vice President, Indian National Science Academy, New Delhi (2010- 2012)
6. Shanti Swarup Bhatnagar Prize in Physics (1983)
7. S.N. Bose Medal of the Indian National Science Academy (1995)
8. Distinguished Fellow , Institute of Peace and Conflict Studies, New Delhi
9. Awarded the van der Waals Chair Visiting Professorship , University of Amsterdam, The Netherlands, 2001. Could not accept because of teaching schedule conflict with JNU.
10. Dr. G.P. Chatterjee Memorial Award of the Indian National Science Academy (1989)
11. Fellow, Indian Academy of Science (since 1978)
12. Fellow, Indian National Science Academy (since 1985)
13. M.S.I.L. Endowed Chair, Indian Instt. of Science, (1991-1993)

#### Administrative/Organisational Positions

##### Current:

1. Founding Member and former Co-Chair (2008- 2014), International Panel on Fissile Materials ([www.fissilematerials.org](http://www.fissilematerials.org))
2. Member, Council of the Raman Research Institute, Bangalore (2013-15, 2016- present)
3. Member of the Council of the Pugwash Conference on Science & World Affairs (2013- present)

4. **Member Asia Pacific Leadership Network (Headquarters: Canberra, Australia)**
5. **Member, Permanent Monitoring Panel -- Mitigation of Terrorist Acts, World Federation of Scientists, Erice, Italy**

**Past:**

1. **Vice President, Indian National Science Academy, New Delhi (2010-2012)**
2. **Member ,World Economic Forum's Global Agenda Council on Nuclear, Biological & Chemical Weapons, 2012-14**
3. **Member, Science and Security Board, The Bulletin of Atomic Scientists, U.S.A. Two 3 –year terms (2013-15; 2016-18)**
4. **Member, NTI Verification Pilot Project, Nuclear Threat Initiative, Washington DC**
5. **Member Academic Council, Tata institute for Fundamental Research, Mumbai (2008-12)**
6. **Member, Executive Committee, Institute for Peace and Conflict Studies, New Delhi (2006-09)**
7. **Member, Board of Governors, Centre for Developing Societies, New Delhi, Two 3 –year terms ( 2012- 14: 2015-18)**
8. **Member, International Panel of Experts, NTI-Index of Nuclear Materials Security 2011**
9. **Council Member , Indian National Science Academy (2004-06)**
10. **Editor, PRAMANA - Indian Journal of Physics (1989-1992)**
11. **Member, Board of Editors, "Science and Global Security",**

(Taylor & Francis publishers, USA

12. Member Sectional Committee in Physics, Indian Academy of Sciences  
1988

13. Member Sectional Committee in Physics, Indian National Science  
Academy 1988-90, 2007

14. Chairman, Centre for Theoretical Studies, Indian Institute of Science,  
Bangalore ( 1979 to 1981

15. Convener, Institute Theoretical Physics Programme, Indian Institute of  
Science, Bangalore (November 1981 to September 1984; 1986-1990)

16. Member, Editorial Board, International Journal of Modern Physics,  
World Scientific Publishing Co, Singapore (1986-1989)

17. Member, The Pylee Committee on Unit Costs of Higher Education  
(The University Grants Commission of India)

18. Member of the Court, NEHU University, Shillong

19. Member of the Court, Manipur University

20. Member of the Council of the Inter-University Centre for Astronomy and  
Astrophysics, Pune , India (2003,2004)

21. Executive Council Member , Indian Social Science Academy (Committee  
memberships within my home institutions and selection committees at  
various universities not listed)

## **R. Rajaraman: Publications list**

### **A. Books and Monographs**

1.
  - a. **“Solitons and Instantons”** a single-author book, Published by **Elsevier North Holland Co** (Two editions 1982 and 1987)
  - b. Russian translation of above by **Soviet Press MIR** (1987)
2. Editor, **“India’s Nuclear Energy Programme : Future Plans, Prospects and Concerns** , published by the **Indian National Science Academy** and Academic Foundation, 2013
3. **“Some Non-Perturbative Semi-classical Methods in Quantum Field Theory”**  
A Monograph, **Physics Reports** 21.4 (1975) The entire issue.
- 4 Contributed, by invitation, chapters to about 10 books over the years reviewing frontier areas of the time, published by North Holland, Plenum Press, John Wiley and others.  
[ Full details of these books are given below]

## B. Articles

This list consists of **two parts**:

The **first** part consisting of about **75** publications lists technical articles, policy articles and Op-eds, on **nuclear and educational policy**.

The **second** part lists about **120** research articles in **pure Theoretical Physics** spanning *Elementary Particle Physics , Nuclear Theory, Quantum Field Theory, Soliton Theory, Condensed Matter Physics and Statistical Mechanics*.

### B1. Nuclear and Educational policy

1. **“India’s Nuclear Energy Program”**, Dialogue- Journal on Science, Scientists and Society, Published by the Indian Academy of Sciences, **25 July (2018)**,

2. ***“Emphasis on scientific research – the flip side”*** , Current Science, Volume 113, Number 8, 25 October (2017)
3. ***“South Asia is not the most dangerous place on Earth”*** Bulletin of the Atomic Scientists , April 26, (2017)
4. ***“It is Time India Signs the Nuclear Test Ban Treaty”***, THE WIRE, January 6, ( 2017),  
<https://thewire.in/94539/india-nuclear-test-ban-treaty/>
5. ***“ Legacy quest for a safer world”*** , The Hindu, Edit page, August 9, (2016) <http://www.thehindu.com/opinion/op-ed/us-president-barack-obama-legacy-quest-for-a-safer-world/article8960435.ece>
6. ***“Wanted a Nuclear Joint family”*** Invited column, India Today, April 15, 2016
7. ***“India and the Nuclear Security Index”*** Invited Article, Global Asia , Volume 11, No.1 Spring (2016)
8. ***“The Indian National Perspective in Promoting Nuclear Security”*** in ***“International Cooperation for Enhancing Nuclear Safety, Security, Safeguards and Non-proliferation”*** Editors: Luciano Maiani, Said Abousahl and Wolfango Plastino , Springer International Publishing, Switzerland (2016)
9. ***“Fission in Troubled Waters”*** Oped in the edit page of the Economic Times , January 3rd (2015)
10. ***“Battlefield weapons and missile defense: Worrisome developments in nuclear South Asia”***, Bulletin of the Atomic Scientists, Vol. 70: 68, (2014)
11. ***“Minimum Deterrent and Large Arsenal”***  
Oped in edit page of the The Hindu, July 2nd (2014)
12. ***“Reset Nuclear Power Clock”***  
Oped in the edit page of the Economic Times , June 5<sup>th</sup>, 2014
13. ***“Deterrence at Stake”***



**Oped in the edit page of the Times of India, Sept,20, 2013**

- 14. Three essays for the “Roundtable on Nuclear Disarmament”**

**The Bulletin of Atomic Scientists, Sept to November, 2012**

- 15. “Fukushima : An Industrial Disaster but not a Nuclear Apocalypse”**

**The Bulletin Of Atomic Scientists, March 30, 2011**

- 16. “The Saga of the Civilian Nuclear Deal: How the 123 Agreement Came into Being”**

**Tehelka, November 13, 2010 issue, pp. 32-33**

- 17. “A Slow but Necessary Ascent”**

**The Hindu, Oped in Edit pages, March 26, 2012**

- 18. “ Defusing the Threat of Grave Dirty Bomb Hype”**

**Article in the Asian Age, Dec 20, 2011. Reprinted in the Deccan Herald**

- 19. ‘Defuse the Koodangulam Stir at the Earliest’**

**Q&A session published in The Asian Age, November 15, 2011**

- 20. “Confronting Fears of Radioactivity”**

**Oped in the Edit Pages, The Hindu, April 9, 2011**

- 21. “Terrorism in India and the State Response”**

**Report as panelist to the Permanent Monitoring Panel on Mitigation of Terrorist Acts, 43rd Session of the Erice international seminars on Planetary Emergencies, Erice 19 - 25 August 2010**

- 22. “Keep On Talking”**

**The Edit Page , The Times of India, July 22, 2010**

- 23. “India & the Nuclear Security Summit”**

**The Edit Page , The HINDU, April 12, 2010**

24. “India’s Arms Control Quandary”, Invited article, The Bulletin of Atomic Scientists, March-April issue , pp. 27-36, (2010)
25. “Prospects for a Fissile Materials Treaty and its Implications for India”  
in *India and Global Nuclear Disarmament*, Ed V.R. Raghavan, Macmillan Publishers India Ltd. pp. 77-105, ( 2010 )
26. “The fizzle doesn’t really matter”  
The Edit Page, The Hindu, Sep 16, 2009
27. “India and Nuclear Disarmament”  
With Zia Mian and M. V. Ramana, July 2009  
In “*Reducing and Eliminating Nuclear Weapons: Country Perspectives on Fissile Materials and Nuclear Disarmament*”  
A Companion Volume to Global Fissile Material Report 2009
28. “Exploring Uranium Resource Constraints on Fissile Material Production in Pakistan” With Zia Mian and A.H.Nayyar, *Science and Global Security* , vol 17, nos.2 and3, pp77-109, Gordon and Breach (U.K.) (in print 2009)
29. “Obama’a Prague Spring”  
Edit page, The Times of India 1st May, 2009
30. “Implications of the Indo-US Nuclear Deal for India’s Energy and Military Programs” in Indo-US Nuclear Deal Ed: P.R. Chari , Routledge, New Delhi, 2009, pp. 123-142
31. “Prepare for cut-off”  
Edit page, The Times of India 23<sup>rd</sup> February 2009
32. “Towards a zero-nuclear weapon world”

The Edit Page, The HINDU, Saturday, Jan 03, 2009

33. “Nuclear Fallout”

Defense and Security of India, Vol 1, issue 3, pp42-47, 2008

34. “Implications of India joining the nuclear club”

Economic Times, 16 Sep, 2008

35. “Nuclear deal’s benefits will flow from the choices we make hereafter”

Invited Oped in Mail Today, September 11, 2008

36. India and the FMCT”

Country Perspectives on the Challenges to a Fissile materials (Cutoff) Treaty

An IPFM Report September 2008, [www.fissilematerials.com](http://www.fissilematerials.com)

37. “Estimates of India’s Fissile Material Stocks”

Science and Global Security , vol.16, no.3, pp74-87 (2008)

Gordon and Breach (U.K.)

38. “A Nuclear Weapon Free World—A New Promise?”

Commentary in Pugwash Online , March 17, 2008,

(<http://www.pugwash.org/reports/nw/rajaraman-commentary.htm>)

39. “Get Rid of Nuclear Arms”

The Times of India , Leader article on Editorial page,

March 5, 2008

40. “Is our technological manpower keeping pace?”

The Hindu , Edit page, December 4, 2007

41. **“The 123 Agreement in Perspective” in “Course Manual for GOI Officials”, Institute for Peace and Conflict Studies, 2007**
42. **“The India-US Nuclear Deal: The perspective of a non governmental scientist” in “Canadian Policy on Nuclear Cooperation with India”, Ed: Sasikumar and Huntley; Simons Centre for Disarmament and Non-Proliferation Research 2007 . ISBN 978-1-4303-0811-9**
43. **“ Plutonium Production in India and the US-India Nuclear Deal”, with Zia Mian, A.H.Nayyar, and M.V. Ramana in “Gauging U.S.-India Strategic Cooperation”, Henry Sokolsky Ed; Strategic Studies Instt., (2007) ISBN 1-58487-284-5, 2007**
44. **“The Basics of Nuclear Reactor, Weapons and their fuel”**  
**in “Course Manual for GOI Officials”, Institute for Peace and Conflict Studies, 2007**
45. **“ A Fruitless Venture”**  
**The Hindustan Times, Edit page, April 30, 2007**
46. **“So, What is the Big Deal?”**  
**The Hindustan Times, Edit page, Nov 21, 2006**
47. **“Rescue Nuclear Disarmament from the Backburner”,**  
**The Hindu, Edit Page, November 13, 2006**
48. **“Fissile materials in South Asia and the implications of the U.S.-India nuclear Deal”, with Zia Mian, A.H.Nayyar, and M.V. Ramana**  
**Science and Global Security, Vol. 14, nos.2 and 3, (2006).**

Gordon and Breach (U.K.) publishers

49. "Fallout from Nuclear Deal",  
The Economic and Political Weekly, pp 3351, August 5, 2006
50. "Who's Afraid of the Nuke Deal?",  
Indian Express, Edit Page, February 14, 2006
51. "Split the Atomic",  
The Hindustan Times, Edit Page, November 22, 2005
52. "Nurturing the Indo-US Agreement"  
in "The Debate on Indo-US Nuclear Cooperation", published for Delhi  
Policy Group by Bibiophile South Asia, New Delhi, 2005
53. "India-U.S. deal and the Nuclear Ceiling"  
The Hindu, Edit page, September 10, 2005
54. "Sixty Years Without Nuclear War", with Zia Mian, and Frank von Hippel |  
Foreign Policy in Focus, August 22, 2005
55. "Cap the Nuclear Arsenal Now"  
The Hindu, Edit Page, 25<sup>th</sup> Jan 2005
56. "Potential Ground Zero"  
The Hindustan Times, Editorial page, 11<sup>th</sup> Jan. 2005
57. "Nuclear Civil Defense in South Asia: Is it Feasible?"  
with Zia Mian and A.H . Nayyar  
The Economic and Political Weekly, Vol.XXXIX, nos 46 and 47,  
pp 5017-5026, November 20, 2004

58. “Reducing Nuclear Risk “, with M. V. Ramana  
The Hindu, Editorial page, June 4, 2004
59. “When Early Warning is No Warning “, with Zia Mian & M.V. Ramana  
The Hindu, Editorial page, July 2, 2004
60. “Steps for Nuclear Talks”, with Zia Mian, A H Nayyar and M V Ramana  
The News, Islamabad, Friday, 2 July 2004
61. “Nuclear Early Warning in South Asia -- Problems and Issues “  
with Zia Mian and M.V. Ramana  
Special Article, The Economic and Political Weekly,  
January 17, 2004
62. “Early Warning in South Asia – Constraints and Implications “  
with Zia Mian and M.V. Ramana  
Science and Global Security, Vol. 11, pp 109-150, 2003
63. “Nuclear posture”  
The Hindu, Editorial page, February 7, 2003
64. Book Review of “In The Shadow of The Bomb – Bethe, Oppenheimer  
and  
the Moral Responsibility of the Scientist “ by S. S. Schweber ,  
Current Science, Vol.83, No.1, 74-75, (2002).
65. “Possession and Deployment of Nuclear Weapons in South Asia – An  
Assessment of Risks” with Zia Mian and M.V.Ramana  
The Economic and Political Weekly, Vol. XXXVII, no.25, pp2459-2466,  
(2002)

66. “ Nuclear Role Models”  
With Zia Mian and Frank von Hippel  
  
Oped in The Wahington Post, Tuesday, August 6, 2002; Page  
A15
67. “ Ban Battlefield Nuclear Weapons “  
  
THE HINDU , Editorial page, 22<sup>nd</sup> April, 2002.
68. " Yet Another Nuclear danger “, with Zia Mian and M.V.Ramana  
  
FRONTLINE magazine, August 17, 2001
69. "Delay Deployment : Towards nuclear Risk Reduction"  
  
The Times of India , Editorial Page, October 1st, 1999.
70. "Privatising Academia"  
  
The Times of India, Editorial page, September 5th, 1995.
71. `On our Nuclear Energy Debate'  
  
Bulletin of Sciences Vol.4 No.2, pages 10-12, (1988).
72. There is no Real Debate on Our Nuclear Programme`  
  
The Times of India, Editorial page , 28 April 1988 (Delhi Edition);
73. “Higher Education: To set the House in Order”  
  
The Economic and Political Weekly, Vol. VII, No.10 , pp 554-557, (1972).
74. “The Ritual of Higher Education”  
  
Sunday World , The Hindustan Times , Page 1 (Dec. 5, 1971).

**75. “Faculty and Departmental Organisation: Structural Changes”**

**Management and Organisation of Indian Universities**

**Transactions, Volume 19, page 109, (1971).**

**76. “The Unclear Nuclear Debate”**

**The Illustrated Weekly of India, July 12, (1970)**

## **B 2. Physics Publications**

**77. Three-Nucleon Clusters in Nuclear Matter'**

**Phys. Rev. 129, 265 (1963).**

**78. The Three-Body Effect in Nuclear Matter to All Orders in Perturbation'**

**Phys.Rev., 131, 1244 (1963)**

**79.**

**'Overlapping Channels and Multichannel Phenomenon'**

**(With L.Susskind)**

**Nuovo Cimento, Series X, Vol. 38, 1201 (1965).**

**80.**

**Magnetic Moments of the  $3/2$  Decuplet from the Algebra of Current Components'**

**Phys. Rev. 145, 1164 (1966).**

**81.Omega minus Decay Modes'**

**Phys. Letters 22, 102 (1966).**



82.

'The Effect and Treatment of Long Range Forces in the  
Theory of Nuclear Matter'

Phys. Rev. 155, 1105 (1967).

83.

'The Three-Body Problem in Nuclear Matter'

(With Hans A. Bethe)

Rev. Mod. Phys. 39, 745 (1967).

84.

'Mass and Inertia'

Encyclopedia of Physics, Rheinhold Publishing Co.

(New York) (1967).

85.

'Irreducible Tensors in SU(n) and Related groups'

Cornell University LNS preprint LNS 65/4 (1965).

86.

'Backward Compton Scattering Sum Rule and the  $\pi \rightarrow 2 \text{ Gamma}$   
and  $\text{Eta} \rightarrow 2 \text{ Gamma}$  Decay Rates',

(With S. Rai Choudhury)

Phys. Rev. 169, 1218 (1968).

87.

'Three Body Forces in Nuclear Matter',

**(With B.H.J. McKellar)**

**Phys. Rev. Letters 21, 450 (1968).**

**88. Self Consistent High Energy Scattering of Zero-Mass**

**Leptons: The Coupled Channel Case'**

**Phys.Rev. 178 , 2221 (1969).**

**89. The High Energy Behaviour of Scattering due to**

**Massless (Neutrino) Exchange'**

**Phys. Rev. 178, 2211 (1969)**

**90. `Long Range Corrections to the Coulomb Potential and**

**Their Implications about Weak Interactions'**

**(With S.J. Chang)**

**Phys. Rev., 183, 1442 (1969).**

**91. `Remarks on the Kinematics of Multiperipheral Processes'**

**(With S.J. Chang)**

**Phys. Rev. , 183, 1517 (1969).**

**92. `Very High Energy Inelastic Hadron-Hadron Collisions'**

**Phys. Rev. D1, 118 (1970).**

**93. `A Constraint on the Structure Functions in Electro-**

**production', (With S.R.Choudhury)**

**Phys. Rev. D2, 2728 (1970).**

94. 'Fixed Pole in the Virtual Compton Scattering  
Amplitude A<sub>2</sub>' (With G.Rajasekaran)  
Phys. Rev. ,D3, 266 (1971).
95. One Photon Exchange Contribution to Inelastic Hadronic  
Collision' (With S.H.Patil)  
Nuclear Physics 26B, 258 (1971).
96. 'Effect of Correlation on the Contribution of Three Body  
Forces to the Binding Energy of Nuclear Matter'  
(With B.H.J.McKellar)  
Phys. Rev., C3, 1877 (1971).
97. 'Phenomenology of Multipion Production in p-anti p  
Annihilation' (With R.P.Jain).  
Phys. Rev. D4, 2768 (1971).
98. 'Cancellation Effect among n-Body Clusters in Liquid He 3 and Nuclear Matter',  
(With R.K.Trehan).  
Phys. Rev. A5, 392 (1971).
99. 'Evaluation of the Triple - Pomeronchkon - Vortex from Experiment'  
Phys. Rev. Letters 27, 683 (1971).

- 100.**  
**Some Consequences of Exchange Degeneracy and the Triple -  
Regge Hypothesis', (With J.Finkelstein)**  
**Physics Letters 36B, 459 (1971).**
- 101.**  
**'Inclusive Experiments, Exchange Degeneracy and Reggeon  
Total Cross Sections', (With .Finkelstein)**  
**Phys. Rev. D5, 672 (1972).**
- 102.**  
**'Relationship between Hadronic and Electronic Excitation  
of N + Resonances', (With S.R. Choudhury)**  
**Phys. Rev. D5, 773 (1972).**
- 103.**  
**'Nucleon Fragmentation in Inelastic Electron Scattering'**  
**(With S.R.Choudhury)**  
**Phys. Rev. D5, 694 (1972).**
- 104.**  
**Fragmentation in a Phi-3 Theory Ladder Model'**  
**(With A. Banerjee)**  
**Phys. Rev. D6, 3641 (1972).**

**105.**

**'Some Consequences of the Zero of the Triple-Pomeron-Vertex'**

**Physics Letters 40B, 392 (1972).**

**106.**

**Decoupling of the Pomeron - Pole from All Inelastic Processes'**

**Phys. Letters 42B, 271 (1972).**

**107.**

**inclusive Reactions',**

**Invited talk, published in the Proceedings of the**

**First Symposium on High Energy Physics, Department of**

**Atomic Energy, pages 207-229 (1972).**

**108.**

**Application of nuclear matter techniques to liquid**

**helium and neutron stars'**

**'The Many-Body Problem', (R.Pratap and J.Parikh Eds.)**

**146-156 (1972).**

**109.**

**Pionisation in a Phi-3 Theory Ladder Model'**

**(With A.Banerjee)**

**Nuclear Physics B67, 171 (1973).**

- 110.**  
**Many Body Forces in Dense Nuclear Systems'**  
  
(With B.H.J. McKellar)  
  
Phys. Rev. Letters, 31, 1063 (1973).
- 111.**  
**Model Theory of a Dense Strongly Interacting Quantum Liquid**  
  
at O K'  
  
Phys. Rev. A9, 2761 (1974).
- 112.**  
**Effect of Nuclear Correlations on Pion Condensation in**  
  
Neutron Stars'  
  
Phys. Letters 48B, 179 (1974).
- 113.**  
**Polarized Electroproduction as a test of parton models with Structure',**  
(with E.W. Colglazier Jr.)  
  
Phys. Rev., D10, 334 (1974).
- 114.**  
**Narrow Resonances in Statistical Mechanics'**  
  
(With R.F.Dashen)  
  
Phys. Rev. D10, 694 (1974).

**115.**

**Body Forces and the Binding Energy of High Density Nuclear**

**Matter', (with B.H.J. McKellar)**

**Phys. Rev. C10, 871 (1974).**

**116.**

**'Effective Elementarity of Resonances and Bound States in**

**Statistical Mechanics', (with R.F. Dashen)**

**Phys. Rev. D10, 708 (1974).**

**117.**

**Comments on the absence of spontaneous symmetry breaking  
in low dimensions', (with S.K. Ma)**

**Phys. Rev. D11, 1701, (1975).**

**118.**

**Finite Temperature Behavior of a Relativistic Field Theory with Dynamical  
Symmetry  
Breaking'**

**(With R.F. Dashen and S.K.Ma).**

**Phys. Rev. D11, 2950 (1975).**

**119.**

**'Internal Symmetry and the Semiclassical Method in**

**Quantum Field Theory' (with E.Weinberg)**

**Phys. Rev. D11, 2950 (1975).**

**120.**

**'Inclusive Reactions and the Few Body Problem'**

**Invited talk, Proceedings of the VII International**

**Conference on Few Body Problems in Nuclear and**

**Particle Physics', (Mitra and Slaus, Ed.), North**

**Holland Publishing Co., (1976), pages 602-610.**

**121.**

**Effective inter-soliton forces in weak coupling quantum**

**field theories'**

**Physics Review D15, 2866 (1977).**

**122.**

**'Semi classical methods in Quantum Field Theory'**

**Proceedings of the Third DAE Symposium on High Energy**

**Physics (1976), pages 184-208.**

**123.**

**Can strongly interacting particles exist in weak coupling field theories?'**

**Invited talk, proceedings of the International**

**Conference on Frontiers of Theoretical Physics,**



**F.C.Aulack, L.S.Kothari and V.S.Nanda.**

**Editors: Macmillan and Co. (1978) pages 117-121.**

**124.**

**'On the alleged equivalence of certain field Theories'**

**Pramana, 11, 491 (1978).**

**125.**

**'Three and Many-Body Forces, Nuclear Physics'**

**(With B.H.J.McKellar)**

**A chapter in 'Pions in Nuclei', Editors**

**M.Rho and Sir Denys Wilkinson, North Holland**

**Publishing Co. (1979), p 357-405.**

**126.**

**'Modern Theories of Phase Transitions'**

**Invited Plenary Talk; Proceedings of the DAE**

**symposium on Nuclear and Solid State Physics**

**Vol. 21A, page 16 (1978).**

**127.**

**'Elementarity of hadron resonances in Nuclear Matter'**

**A chapter in 'Pions in Nuclei', Editors and**

**Publishers same as above; p 197-227 (1979).**

**128.**

**'The wave function at the origin for large-n, s-wave levels' (with V.Gupta)**

**Physical Review, D19, 697 (1979).**

**129.**

**'Solitons of coupled scalar fields in two dimensions'**

**Phys. Rev. Letters, 42, 200 (1979).**

**130.**

**'Restoration of Symmetry by Radiative Corrections'**

**(with M.Rajlakshmi)**

**Phys. Rev. D23, 2399 (1981).**

**131.**

**'Speculations on High Density High Temperature Hadron Matter in Heavy-Ion Collisions'**

**In 'Nuclear Physics with High Energy Accelerators',**

**B.K. Jain, M.Mehta and B.Sinha Ed., Published by**

**BARC (1981), pages 86-92.**

**132.**

**'Charged Soliton Excitations in Statistical Mechanics'**

**(with M.Rajlakshmi)**

**Physical Review B25, 1866 (1982).**

**133.**

**Derivation of the Decoupling Relations for composite models  
from Anomaly constraints and n-independence' with R.K.Kaul  
Phys. letters, 110B, 385 (1982).**

**134.**

**"The Structure of the Vacuum'**

**Invited review: 'Recent Trends in Theoretical Physics'**

**Editors L.S.Kothari et al McMillan & Co. p 87-97 (1983).**

**135.**

**'On Solitons of Half-Integral Charge'**

**(with J.S.Bell)**

**Phys. letters, 116B, 151 (1982).**

**136.**

**On States, on a lattice, with half-integral charge'**

**(with J.S.Bell)**

**Nuclear Physics B, 220, 1, (1983).**

**137.**

**The Variational Method in Nuclear Matter'**

**Invited review; published in Proceedings of the**

**Commemorative Symposium of SINP p 13-25 (1983).**

**138.**

**The Status of the Delta as a separate Nucleon Species'**

**Invited review, J. of Madras University, Vol. 47 , No.2,**

**110-125 (1984).**

**139.**

**Soliton Energies in Supersymmetric Theories'' (with R.K.Kaul)**

**Physics Letters ,131B, 375, (1983).**

**140.**

**Quantum Supersymmetric Generalization of Bogomolnyi Bounds'**

**Pramana, Vol. 24, 1, (1985).**

**141.**

**Classical Solitons without Quantum Counterparts and Their**

**Revival by Supersymmetry' (with R.K.Kaul)**

**Pramana, 24, 837, (1985).**

**142.**

**Vector Meson Mass Generation by Chiral Anomalies'**

**(with R.Jackiw)**

**Physical Review Letters , 54, 1219, (1985).**

143. **Hamiltonian Formulation of the Anomalous Chiral Schwinger Model'**  
**Physics Letters, 154B, 305, (1985).**
144. **Anomalous Non-Abelian Gauge Theory in Two-Dimensions'**  
**Physics Letters , 162B, 148 (1985).**
145. **"Degrees of Freedom and the Quantisation of Anomalous Gauge Theories' (with J.Lott)**  
**Physics Letters, 165B, 321 (1985).**
146. **'Stability of the Rotating Skyrmion' with H.M.Sommermann,  
J.Wambach and H.W.Wyld**  
**Physical Review ,33, 287 (1986).**
147. **'Making sense of Anomalous Gauge Theories'**  
**in Proceedings of the Second Asia Pacific Physics Conference,  
Ed. S. Chandrasekher, World Scientific Publishing Co. (1987),  
Pages (321-337).**
148. **'On Anomalous U(1) Gauge Theory in 4 Dimensions'**  
**Phys. Letters, B184, 369 (1987).**

**149.**

**Some Remarks on the Finiteness of Soliton Mass'**

**with R.K.Kaul**

**Pramana, 28, 95, (1987).**

**150.**

**Solitary Waves of the 2-dimensional Ferromagnet' in "Solitons",  
M.Lakshmanan Ed.,**

**Springer Verlag Co. p.321-327 (1988).**

**151.**

**Quantum Solitons - an Overview' in "Solitons", M.Lakshmanan Ed.**

**Springer Verlag Co. p.240-250 (1988).**

**R. Sriram, G.Rajasekaran & P.M.Mathews Eds.**

**World Scientific Publishing Co., Singapore,**

**pages 155-192, (1988).**

**152.**

**The Vacuum Functional and the Effective Action'**

**in "Gravitation, Quantum Fields and Superstrings".**

**Op.Cit. pages 193-258, (1988).**

**153.**

## **Quantisation of Anomalous Gauge Theories'**

**Invited talk published in Proceedings of the**

**VIII HEP Symposium**

**M.K.Pal and G.Bhattacharya Ed. (1988) p.104-130.**

**154.**

**Poincare Invariance of Anomalous Gauge Theories'**

**with P.Mitra**

**Phys. Rev., D37, 448 (1988).**

**155.**

**Gauss-law Commutator in the Chirally gauged**

**Wess-Zumino-Witten Model' with R.Percacci**

**Phys. Lett., B201, 256 (1988).**

**156. Constrained Hamiltonian Structure of the Chirally Gauged**

**WZW Model' with R.Percacci**

**International Journal of Modern Physics, A4,**

**4177-4202 (1989).**

**157. Gauge Invariant Formulation of an Anomalous Gauge**

**Theory', with P.Mitra.**

**Physics Letters, B 225, 267 (1989).**

**7**

**158. "Four Dimensional Current Algebra from Chern-Simons Theory"**

**with R.Floeanini and R.Percacci**

**Phys. letters, 231B, 119 (1989).**

**159. "Who is Afraid of Anomalies"?**

**Invited Talk in the Raman Centenary Symposium on**

**Waves and Symmetry.**

**Current Science, Special issue, Vol.59, 1100, (1990).**

**160. "New Results on Systems with Second Class Constraints"**

**with P.Mitra**

**Annals of Physics, (N.Y.), 203, 137 (1990).**

**161. "Gauge Invariant Reformulation of Theories with**

**Second Class Constraints" with P.Mitra**

**Annals of Physics, (N.Y.), 203, 157 (1990)**

**162. "Anomalous Gauge Theories" in "Anomalies, Phases, Defects",**

**Ed: M.Bregola, G.Marmo and G.Morandi**

**Biblioposis (Naples), 1990, pp.303-328.**

**163. "John Stuart Bell - the man and his physics"**

**Invited article, Current Science, Vol. 59, 1282 (1990).**



164.

'Path Integral Quantisation of Topological Field Theories'

with R.K.Kaul.

Physics Letters, 249B, 433, (1990).

165.

"Topological Field Theories"

Current Science, Vol.59, 965-969, (1991).

166.

"A Topological Field Theory Associated with Monopoles",

with R.K. Kaul

Physics Letters, 265B, 335 (1991)

167.

"Gauge Anomalies in Two-Dimensions" in "Quantum Mechanics of Fundamental Systems 3", C.Teitelboim and J.Zanelli Eds., Plenum Press, New York pages 209-222, (1992)

168.

"Cohomological Field Theory"

in "Current Topics in Condensed matter and Particle Physics ",J.Pati, Q.Shafi and Yu Lu Eds., World Scientific, pages 58-82,(1993)

169.

" Non-local Currents in the Massive Thirring Model " ,

with R.K.Kaul

Int. J. of Mod. Phys., A8, 1815, (1993)

170.

"New Non-local Currents in the Quantum Sine-Gordon Model", with S-J. Chang

Phys. Letters, B313, 59, (1993)

171.

'Elementarity'

G.P.Chatterji Memorial Award Lecture , "INSA Award Lectures Diamond Jubilee Issue, pages 1932-42, (1994)

172.

"Currents in the Lowest Landau Level Field Theory in the Presence of e-e Interactions."

Int.J. Mod. Phys., B8, 777, (1994)

173.

"Level Mixing and Solenoidal Terms in Lowest Landau Level Currents" with S. L. Sondhi

Int. J. Mod. Phys., B 8 , 1065, (1994)

174.

"Canonical Quantisation of an Off-conformal Theory"

in "Modern Quantum Field Theory", S.R.Das, G.Mandal, S.Mukhi  
and S.R.Wadia Eds. World Scientific Publishing Co,  
pp 239-249, (1995)

175.

"Chiral Vertex Operators in an Off-Conformal Field  
Theory : The Sine-Gordon Example ", with S-J. Chang

Phys. Rev. D 53, 2102, (1996)

176.

"Umklapp Processes for electrons and their Renormalisation  
Group Flow" with Deepak Kumar

Phys.Rev., B 54, 4379, (1996)

177.

"A Field Theory for the Read Operator", with S.L.Sondhi  
Int. J. Mod. Phys. , B 10 , 793, (1996)

178.

" Umklapp Scattering in Fermi Liquids -- a  
Renormalisation Group Approach", with Deepak Kumar

Int. J. Mod Phys, B 11 , 1813-1828 (1997)

179.

" Generalised Chern-Simons Theory of Composite

**Fermions in Bilayer Hall Systems"**

**Phys. Rev., B 56 , 6788-6794, (1997)**

**180.**

**" Meson Pseudospin Solutions in Quantum Hall Systems"**

**with Sankalpa Ghosh**

**Int.J. Mod. Phys., B 12 , 37 - 48 , (1998)**

**181.**

**"The Role of Symmetries in the Sciences versus the**

**Arts -- A Contrast "**

**Current Science, vol 73 , no. 7, 570 - 575, (1997)**

**182.**

**"Fermi Liquid Theory on Lattices" with Deepak Kumar**

**in "Electron Correlations in Atoms and Solids", A.N.Tripathi**

**and Ishwar Singh, Ed ; Phoenix Publishers , 79-88, (1998)**

**183.**

**"Bimerons in Double Layer Quantum hall systems",**

**with Sankalpa Ghosh**

**Int. J. Mod. Phys. , B 12 , 2495-2512, (1998)**

**184.**

**"Broken Symmetry Ground States in  $\nu = 2$  Bilayer**

**Quantum Hall Systems ", with A.H.MacDonald and T.Jungwirth,**

**Phys Rev., B 60 , 8817, (1999)**

**185.**

**"Chern Simons Field and Composite Bosons in Quantum  
Hall Systems"**

**in " Quantum Field Theory : A Twentieth Century profile",  
A. N. Mitra Ed ; Indian National Science Academy Spl volume,  
Hindustan Book Agency, pages 730-741, (2000)**

**186.**

**"Quantum Hall Solitons with Intertwined Spin and Pseudospin" ,  
with Sankalpa Ghosh**

**Phys. Rev., B 63, 35305 (2001)**

**187.**

**Effective Interaction Between Like-Charged Colloids in a 2-D  
Plasma"**

**with Ning Ma and S.M.Girvin,**

**Phys.Rev.,E 63, 21402, (2001)**

**188.**

**Plutonium Dispersal and Health Hazards from Nuclear Weapon  
Accidents"**

**with Zia Mian and M.V.Ramana,**

**Current Science, Vol. 80, no.10, pp 1275-1284, (2001)**

**189.**

**"Quantum Hall Effect and Composite Particles"**

in "Field Theories in Condensed matter Physics", Ed :Sumathi Rao  
Hindustan Book Agency pp 335-358, (2001)

190.

"Fractional Charge"

Invited Talk at the The International Conference in memory of  
John Bell, Vienna .

in "Quantum (Un)speakables", Eds R.A.Bertlemann and A.Zeilinger,  
pp383-399, Springer-Verlag (Berlin) (2002).

<https://arxiv.org/pdf/cond-mat/0103366.pdf>

191.

"CP<sub>N</sub> Solitons in Quantum Hall Systems"

Invited Plenary Lecture at the International Conference on  
GEOMETRY, INTEGRABILITY AND NONLINEARITY IN CONDENSED MATTER  
& SOFT CONDENSED MATTER PHYSICS held at Bansko, Bulgaria .

Europhys. J. B29, 157-162 (2002)

192.

" Mathematics and the Real World" Invited Article.

Current Science, vol. 88, pp.360-366, (2005)

193.

"The Story of Nuclear Matter"

Resonance, vol.10, no.10, pp. 8-32, (2005)

194.

"Professor Hans A. Bethe -- A Brief Homage"

Resonance, vol.10, no.10, pp. 3-5, (2005)

### Invited Lectures/Participation in International conferences /institutions

(Includes only the last **TWO** decades; Earlier data unavailable)

1. Invited talk on **“View from India “** at the discussion meeting on **“Current Crises of Nuclear arms Control and Nonproliferation”,** Program on Science and Global Security, **Princeton University, USA May 6, 2019**
2. Participated the Annual meeting of the **International Panel on Fissile Materials , Princeton, May 4-7 2019**
3. Meeting of the **Science and Security Board of the Bulletin of Atomic Scientists,** to discuss the setting of **the Doomsday Clock 2019,** at **Chicago, USA November, 2018**
4. Lead Speaker in Discussion on **“South Asia”** at the meeting of the **Science and Security Board of the Bulletin of Atomic Scientists,** at **Chicago, USA , November 15, 2018**
5. Invited by from ROSATOM to Participate and judge a competition among an international nuclear agencies at the **X Internationl Forum ATOMEXPO 2018, at Sochi, Russia, 14-16 May 2018**
6. Participated and Chaired a session at the Annual meeting of the **International Panel on Fissile Materials , Seoul , S Korea, April 14-17, 2018**
7. Participated in the South Asia and China Regional Meeting of the **Asia Pacific Leadership Network, Colombo, 18-20 February 2018**
8. Invited Panelist on a Discussion on **“CTBT Role in Enhancing Regional and International Security”** at **Moscow on 18, October, 2017**
9. Attended by invitation the Summer Joint meeting of the Boards and Sponsors of **the Bulletin of Atomic Scientists,** June 12-13, **2017**
10. Participated by invitation in the Annual meeting of the **International Panel on Fissile Materials , Riveira, Beirut , 13 March 2017.**
11. Chaired a session at Workshop on **“The Future of Nuclear Energy in the Middle East”** organized by the Issam Fares

Institute, **American University of Beirut, Beirut**, March 14 and 15, **2017**

- 12.** Delivered a Plenary lecture on ***“The Road to Nuclear Zero: Review and Prospects”*** at The 15th PIIC Beijing Seminar on International Security: Nuclear Nonproliferation and Cooperation, held at **Suzhou, China**, November 1-5, **2016**
  
- 13.** Attend as Board member the 2016 Clock Symposium titled ***“Getting to Deep De-carbonization: What Role for Nuclear Power,”*** at **Chicago, USA** , November 14, **2016**.
  
- 14.** Gave a seminar on ***“An Update on India's nuclear fronts -- civilian and military”*** at the **Belfer Centre of Harvard University USA** and had separate discussions with their postdoctoral scholars at their request. Cambridge, MA USA, November 17, **2016**
  
- 15.** Visited the **Union of Concerned Scientists** for a luncheon discussion with their nuclear experts , Cambridge , MA, USA, November 18, **2016**
  
- 16.** Invited Fermilab Colloquium on ***“The Rocky Road to Nuclear Zero”*** at the Fermi National Accelerator Laboratory, **USA**, **November 18, 2015**
  
- 17.** Invited to attend 6th Annual Clock Symposium and 70th Anniversary Dinner of the **Bulletin of Atomic Scientists, Chicago, USA**, **November 16-17, 2015**
  
- 18.** Plenary talk on ***“Status of Nuclear Energy in India”*** at the 61st Pugwash Conference on Science & World Affairs, **Nagasaki, Japan**, 1-5 November **2015**
  
- 19.** Plenary lecture on ***“What BRICS can do for others on Education”*** at the **BRICS Global University Summit** --Education as resource for global development, **Moscow**, October 26-28 th , **2015**
  
- 20.** Invited lecture on ***“Governance and Regulation in the Nuclear Realm”*** at the **International Workshop on the Global Governance of Climate Engineering**, held at Rockefeller Foundation’s Bellagio Center on Lake Como, **Italy**, October 19 – 23, **2015**.



21. Invited by the **Governor of the Hiroshima Prefecture** to participate in the Hiroshima Round Table, and attend the 70th Anniversary Ceremony of the Bombing, **Hiroshima, Aug 6, 2015**
22. Invited participant in **Asia Pacific Leadership Network**, Annual Members Meeting , **Hiroshima, 7-9 August 2015**
23. Annual meeting of the **International Panel on Fissile Materials**, **Princeton NJ, USA , May 9-10, 2015**
24. Invited talk on "***The Indian National Perspective in Promoting Nuclear Security***" in the **XIX Eduardo Amaldi Conference in Rome** during March 30-31, **2015**.
25. Invited to attend Joint Governing Board & Science and Security Board Meeting of the **Bulletin of Atomic Scientists, Chicago, USA, November 17-18, 2014**
26. Gave a talk on "***Lessons from the three Nuclear security Summits***" at The 14th PIIC Beijing Seminar on International Security: Strategic Stability and Cooperation, **Hangzhou, China, October 19 – 22, 2014**
27. Invited to give 3 lectures: (i) *Science of Nuclear Weapons*, (ii) *India's Nuclear Program and Doctrine* (iii) *Current Affairs: Nuclear Iran* at the **RCSS Summer Workshop** on nuclear disarmament, nuclear security and safety held in **Kalutara, Sri Lanka , 15-24 September 2014**.
28. Invited to participate and give the lead presentation on "***Nuclear Safety and Security***" at the Meeting of **Asia Pacific Leadership Network** Members **Jakarta, Indonesia, 16-18 August 2014**
29. Invited to receive the **Leo Szilard Award** of the **American Physical Society** and deliver the Award Lecture on: "***Fissile Materials: A Global Threat***" at the Annual APS April Meeting 2014, **Savannah, GA , USA April 5-8, 2014**
30. Invited Lecture on "***Current Stocks and Production of Fissile Material***" at the **2014 Nuclear Knowledge Summit: Towards Sustainable Nuclear Security**, at **Amsterdam, the Netherlands, March 21-22, 2014**

- 31.** Invited to participate in the Meeting of **Asia Pacific Leadership Network Members, Ho Chi Minh City, Vietnam, 11-13 October 2013.**
- 32.** Participated in Technical discussions of the **Nuclear Threat Initiative Verification Pilot Project, Las Vegas, USA October 7-10, 2013**
- 33.** Invited to deliver two lectures on
  - (i) ***“Prospects in S Asia of nuclear arms control initiatives”***
  - (ii) ***“India’s Civil Nuclear Program”*** ,and address different research groups at the **Pacific Northwest National Laboratories, Seattle-Richland, USA , June 17-20, 2013**
- 34.** Invited to give a talk on ***“Security issues in South Asia”*** at the Third Professional meeting of the **Union of Concerned Scientists, at Rome, Italy July 27-28 , 2013**
- 35.** Chair the opening session of the Annual meeting of the **International Panel on Fissile Materials, at Chatham House, St James's Square, London, on March 20-24, 2013**
- 36.** Invited Lecture ***“Indo-US Nuclear Energy Cooperation: Has it lost momentum after the 2008 Nuclear Deal?”*** at the **Global Leaders Forum** of the School of Advanced International Studies, **Johns Hopkins University, Washington D.C., on March 1<sup>st</sup> 2013**
- 37.** Nuclear Threat Initiative Verification Pilot Project Meeting, **Washington DC, February 26 – 28, 2013**
- 38.** **World Economic Forum’s Global Agenda Council Summit , on 12-14 November 2012 in Dubai, United Arab Emirates.**
- 39.** Invited to chair the session on ***“Nuclear Security”*** and give a talk on ***“ Introduction to Technical Issues in FMCT Verification”*** at The 13th PIIC Beijing Seminar on International Security, **Beijing, China, October 31 - November 3, 2012**
- 40.** Attended by invitation the meeting of the **Asia-Pacific Leadership Network (APLN) Singapore, September 11-13, 2012**

- 41.** Plenary lecture on ***“The Importance of Public Perceptions of Nuclear Radiation”***, at **INTERNATIONAL SEMINARS ON PLANETARY EMERGENCIES, 45th Session, Erice, Italy, 19 – 24 August 2012**
- 42.** Invited to the **Ottawa Dialogue Summer Plenary Copenhagen, Denmark, 18-19 June 2012**
- 43.** Invited to moderate the Session on ***“Nuclear Terrorism and Nuclear Security Status”*** at the 2012 Seoul Nuclear Security Symposium in Seoul, **S. Korea** on March 23, **2012**.
- 44.** Invited to speak at the conference on **Nuclear Security and the Korean Peninsula** at **Seoul National University, S. Korea** on March 22, **2012**
- 45.** Invited talk on ***“HEU-fuelled sub-universes (i) The World , (ii) South Asia , at conference on HEU AND FISSILE MATERIAL MINIMIZATION at Vienna , January 23-25 2012***
- 46.** Invited to speak on ***“Fissile Materials in S. Asia: Current position and future prospects”*** at the Pacific Basin Nuclear Conference in **Busan , S. Korea** on March 20, **2012**
- 47.** Invited to give the Lunchtime talk **at the 3rd Annual Doomsday Clock Symposium at Washington, D.C. January 9 - 10, 2012**
- 48.** Invited to the **2012 NTI Nuclear Materials Security Index Release function , Washington, DC, January 11, 2012**
- 49.** Invited to participate in the **Plenary Session of the Ottawa Dialogue, at Copenhagen on 12-13, December 2011**
- 50.** Invited to chair the first session and talk on ***“Country perspectives on FMCT”*** at the IPFM Annual Meeting, at **Princeton, USA, 17-20, Nov. 2011**
- 51.** Invited to give a talk on ***“Nuclear Security Beyond 2012”*** at the IFANS-KINAC-FMWG Conference on **“The 2012 Seoul Nuclear Security Summit and Next Generation Nuclear Security”** at **Seoul** on **November 2, 2011**
- 52.** Participated in the Second International Expert Panel meeting on **Benchmarking Nuclear Security** at **Washington, D.C,USA** on **July 25, 2011**

53. Invited by the Honorable George Shultz, former US Secretary of State for a special plenary meeting of the **Ottawa Dialogue**, held at the Hoover Institution in **Stanford, California, USA** on **July 6-8, 2011**,
54. Invited to participate in the Plenary Meeting of the Ottawa Dialogue at **Istanbul, Turkey , 26-27 March, 2011**
55. Invited to participate as expert in the **International Expert Panel** meeting for **Benchmarking Nuclear Security Index** at **London** on **March 14-15, 2011**
56. Invited to give talk at the **Tri-lateral Dialogue between India, China and Pakistan** at **Bangkok, Thailand** on **29-30, January 2011**
57. Invited to talk at the meeting on **Avenues for Cooperation on Nuclear and Radiological Security** **International Institute for Strategic Studies (IISS)**, at **London** on **21 January, 2011**
58. Invited to give **two** lectures at the **ISODARCO Winter Course on “International School on Disarmament and Research on Conflicts”** held at **Andalo (Italy)** during **9-16, January, 2011**
59. Invited to participate and give a presentation on **Fissile Materials** at the **Plenary Meeting of the Ottawa Dialogue, Bangkok, 12-13 December. 2010**
60. Invited to participate in the conference on **“The Future for Nuclear Non-proliferation and Disarmament”** organized by the **Ditchley Foundation, Ditchley Park, U.K. , on 2-4 December 2010**
61. Invited to participate in the **FMCT and Strategic Stability** subgroups of the **Ottawa Dialogue, Dubai , November 7-9, 2010**
62. Invited to give a talk at the conference **Next Generation Nuclear Security: Meeting the Global Challenge**, organized by the **Fissile Materials Working Group (FMWG). Washington D.C on April 12, 2010**
63. Invited to Chair a session, give a talk and participate in **The Tokyo IPFM meeting 2010, at Tokyo March 17-20, 2010**
64. Invited to give a talk at the **‘2010 Moscow Non-Proliferation Conference’** organized by the **Center for Energy and Security Studies, at Moscow March 4-6, 2010**
65. Invited to participate and give a talk at the **2010 Doomsday Clock Symposium and Announcement, New York , January 13-14, 2010**
66. Invited talk on **“Disarmament -- Prospects and Challenges in S. Asia”** at the **Ottawa Dialogue “Nuclear Stability in South Asia, Bangkok Dec 11-14, 2009**

**67.** Invited to give a presentation on CBMs at the Pugwash meeting on **“Strengthening the International Nuclear Non-Proliferation Regime: Ensuring a Successful NPT Review Conference in 2010”**

**Beijing, China, 20-21 November 2009**

**68.** Invited to Participate and gave a presentation on S Asia at the **Meeting to set the Doomsday Clock of the Science and Bulletin meeting, Washington DC, 5-6 ,November 2009**

**69.** Invited to participate and make a presentation at the **IPFM Washington, DC Meeting, 16-18 October 2009**

**70.** Invited Talk on **“Indian Response to the Prospect of WMD Terrorism”** at the Permanent Monitoring Panel on Mitigating Terrorism **Erice, Sicily, August 24-25, 2009**

**71.** Invited to give a talk and chair a session at the **11th PIIC Beijing Seminar on International Security, 26-31 October 2008 at Qingdao, China**

**72.** IPFM presentation **“FMCT”** at International Atomic Energy Agency, at **Vienna, Sep 30-Oct1, 2008**

**73.**

**74.** Meeting of the **Permanent Monitoring Panel -- Mitigation of Terrorist Acts,**

**World Federation of Scientists,**

**May 26-29, 2008, at Erice, Italy**

**75.** Gave a talk at the meeting on **“A New Nuclear World Order: Asian Perspectives”**

Organised by Brookings Institution and the Center on Asia and Globalisation, the Lee Kuan Yew School of Public Policy, National University of Singapore, at **Singapore, March 6-7, 2008.**

**76.** Invited to be a discussant at the conference on **“Achieving the Vision of a World Free of Nuclear Weapons”**, organized by the Norwegian Foreign Ministry, **Oslo, Norway, February 26-27, 2008**

- 77.** Gave a presentation on *“Introduction to IPFM and Its Activities”* at the **Royal Society of London, U.K., October 11, 2007**
- 78.** Invited to give a talk at the conference *“Revitalizing Nuclear Disarmament”* on the occasion of the The 50th Anniversary of the Pugwash Conferences,  
**Pugwash, Nova Scotia, 5-7 July, 2007**
- 79.** Invited to give a talk on the Indo-US Nuclear Deal at the conference on *“Canadian Policy on Nuclear Cooperation with India”*, Simons Centre for Disarmament and Non-Proliferation Research, **Ottawa, March 2007**
- 80.** Invited to deliver a public lecture on *“Prospects for Disarmament in S. Asia and the Indo-US nuclear Deal”* at the University of Melbourne  
**Melbourne, Australia, November 30, 2006**
- 81.** Invited to summarise the *“The Indo-US Nuclear Agreement”* at the 55th Pugwash Conference on Science and World Affairs, **Cairo, Egypt, 11-15, November 2006**
- 82.** Invited to deliver a talk at the International Workshop on *“Cooperative Stability in South Asia: Different Roles for Different Players”*, Oct 2, 2006 at **Como, Italy**
- 83.** Invited to make a presentation, on *“FMCT and Disarmament”* at the **Conference of the Middle Powers Initiative,**  
September 27, 2006, **Ottawa, Canada**
- 84.** Invited to talk about *“The Indo-US Nuclear Deal”*, at the **Ettore Majorana Institute, Erice, Italy** August 19-15, 2006
- 85.** Invited to address the **Conference on Disarmament, Geneva,** on *“Fissile Materials and Arms Control”*, **Geneva,** May 16, 2006

- 86.** Participated by invitation at **the International exploratory workshop on IPFM** in **Washington, DC**, April 6-8, 2005
- 87.** Invited to deliver a talk at the International Workshop on **“Cooperative Stability in South Asia: Different Roles for Different Players”** , at **Como, Italy**, Sept 26, 2005
- 88.** Invited to participate and **chair** a session at **The 9th PIIC Beijing Seminar on International Security Nanjing, China** 12-15 October, **2004**.
- 89.** Invited to summarise the “Prospects of Disarmament in S. Asia” at the **54<sup>th</sup> Pugwash Conference on Science and World Affairs, Seoul, South Korea**, 4-9 October **2004**
- 90.** Invited to participate and make give a lecture at the **International Workshop and Round Table on Security Issues and Economic Co-operative Dimension in South Asia: Towards a Regional Stability**. September 27, **2004**, at **Como, Italy**
- 91.** Invited to participate and give a talk at the **RANSAC Workshop on Expanding Threat Reduction** July 27, **2004**, **Washington D.C**
- 92.** Invited to participate and make a presentation at the second **Pugwash Workshop on South Asian Security** ,  
 . **Geneva, Switzerland**, May15-18, **2003**
- 93.** . Invited to organise and **chair** the session on South Asia at the **1<sup>st</sup> International Professional Meeting of Independent Technical Security Analysts**,  
 July 23-24, **2002, Chicago**
- 94.** Invited to participate and make a presentation at the **Pugwash Workshop on South Asian Security** , 1-3 November **2002** , **Geneva**
- 95.** Delivered the opening Plenary lecture and also chaired a session at the International Conference on **“Geometry, Integrability and Non-Linearity”** organised by Los Alamos

Labs, USA, ICTP, Italy and The Bulgarian Academy of Sciences July 15<sup>th</sup> to 20<sup>th</sup>, **2001, Bansko, Bulgaria**

**96.** Chaired a session at the Second International Workshop on "**Charge, Flux, Topology and Statistics**" June 25-30, **2001, University of Amsterdam, Holland**

**97.** Invited to lecture at the International Summer Symposium on **Science and World Affairs**, July 20-30, **2001**. The European Academy at **Berlin**

**98.** Invited to lecture on "**Fractional Charge**" at the conference on "**Quantum Unspeakables**" at the **Erwin Schrodinger Institute for Theoretical Physics**). This was a limited invitation meeting to honour the memory of the eminent theorist JS Bell. November 10-14, **2000, Vienna**

**99.** Invited to visit **Cambridge University, U.K.** as the guest of the Master of St. Johns College and lecture on "**Fractional Quantum Hall Effect**" at the Dept of Applied Mathematics and Theoretical Physics. (July 4-11, **1999**)

**100.** Invited to give a lecture and chair a session at the First International Workshop on "**Charge, Flux, Topology and Statistics**" at the **University of Amsterdam**, July 16-30, (**1999**)

**101.** Invited to participate and chair the concluding session in the International Conference on "**Disorder and Interactions in Quantum Hall and Mesoscopic Systems**" at the Institute for Theoretical Physics, University of California, August **1998, Santa Barbara, U.S.A.**