

Curriculum Vitae - Prof. A.K. Jain



Prof. A.K. Jain is presently a senior Professor of Physics at I.I.T. Roorkee, where he has been engaged in teaching and research since 1979. Prof. A.K. Jain obtained his education right from the school to Ph.D. from the well known *Banaras Hindu University*. After a brief period of Post-Doc at BHU, he joined the erstwhile *University of Roorkee*, now the *Indian Institute of Technology Roorkee*, in 1979. He became a full Professor at IIT Roorkee in 2001 and served as the Head of the Department from Jan. 2011 to April 2014. He has been able to promote the department to new heights during his brief tenure of Headship largely due to his excellent management skills and leadership qualities. Department grew phenomenally, both academically as well as facilities wise under his leadership.

Dr. Jain has been at the forefront of Nuclear Structure Physics in India for the last 34 years, having contributed to a variety of areas and topics. Every thesis (10 completed and three in progress) under his supervision has been on a new topic. *He has published more than 100 papers in top rated journals including two extensive studies in the prestigious journal, **Reviews of Modern Physics**, which has an impact factor in the range of 30-40.* Both the articles mainly focus on the work carried out by him. He is known for his simple approaches and a focus on basic underlying physics in complex problems. He is an excellent teacher and speaker having delivered several dozens of lectures/lecture series in various conferences, and schools.

During his long career, he has also visited and worked at the Florida State University, McMaster University, Kuwait University and Yangon University as a Research Associate/Visiting Professor. Besides, he has also visited a number of other labs and universities abroad. He was deeply involved in the conversion of the University of Roorkee to the IIT Roorkee in 2001. It has provided him a unique experience and perspective of the working of a university system and an IIT system, both. He is a member/Chair of a number of national and international committees.

Prof. Jain also has a deep interest in the philosophical and spiritual traditions of various religions with a focus on the Indic religions. His father, Late Sidhantacharya Pandit Phool Chandra Shastri, a freedom-fighter, social activist, was a renowned scholar of Jainism, Sanskrit and Prakrit. Prof. Jain carries forward his father's legacy in many ways.

- 1. Awarded by IIT, Roorkee, "Star Performer" in teaching and research, 2004.**
- 2. Acharya Sumatisagar Smriti Award, 2009, for his work on English translation of Jain canons.**
- 3. Outstanding Service Award 2013, by Indian Nuclear Society (Dept. of Atomic Energy).**

Date of Birth: 20th April 1950
Nationality: Indian

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Education & Qualifications:

1972-1977

Banaras Hindu University
Ph.D.(Physics)

Topic: *Description of High Spin Features of Yrast Bands in Deformed Nuclei*

1970-1972

Banaras Hindu University
M.Sc. (Physics), *First Div.*

1967-1970

Banaras Hindu University
B.Sc. (Physics), *First Div.*
Distinction in Mathematics

1966-67

Banaras Hindu University
P.U.C., *First Div.*
Distinction in Mathematics

1965-1966

Children's School, B.H.U.
Admission Examination, (High School), *First Div.*
Distinction in Mathematics

WORK:**Areas of Professional Experience:**

Theoretical Nuclear Physics: Nuclear Structure Physics.

In recent years, he has also guided many Ph.D.s in Experimental Nuclear Physics, and application of nuclear physics in atmospheric phenomena.

Teaching Experience:

1. Post graduate and under-graduate teaching for the past 34 years.
2. Ph.D. Thesis guided (10), in progress (3).
3. M.Phil. Thesis guided (2).
4. M.Sc. projects guided (more than 60).

Courses taught:

Advanced Nuclear Physics,	Elementary Nuclear & Particle Physics
Physics for Engineers (Ph-101,102),	Classical Mechanics
Quantum Physics,	Advanced Quantum Mechanics
Angular Momentum Algebra,	Group Theory
Computer Simulation ,	Nuclear Physics and its applications

Employment Record:

S.No.	Employer	Position	Period
1.	I.I.T. Roorkee	Professor (HAG)	Jan 2013- present
2.	I.I.T. Roorkee	Professor	June 2001- Dec. 2012
3.	-do-	Professor & Head	Jan. 2011 – April 2014
4.	University of Roorkee	Associate Professor	April 1996-May 2001
5.	-do-	Reader	Aug 1994- March 1996
6.	-do-	Lecturer (Sr.)	Sept 1992-July 1994
7.	-do-	Lecturer	Sept 1979- Aug 1992
8.	B.H.U.	Research Associate	Jan 1978-Aug 1979
9.	Brookhaven Natl. Lab	Visiting Scientist	July-Aug, 1986
10.	Florida State University	Research Associate	Aug 1987-July 1988
11.	Florida State University	Research Associate	June 1989-Aug 1989
12.	McMaster University	Visiting Scientist	June 1997-Aug 1997
13.	McMaster University	Visiting Professor	May 2004-June 2004
14.	McMaster University	Visiting Professor	June 2005
15.	Kuwait University	Invited Visiting Professor	Academic Year 2005-06
16.	Kuwait University	Visiting Scientist	March 2007
17.	Yangon Univ, Myanmar	Visiting Professor	July-Aug 2005
18.	IST, Lisbon, Portugal	Visiting Professor	June 2007
19.	NNDC, Brookhaven National Laboratory	Visiting Scientist	June 2008

Research Projects:

1. **P.I.**, Study of Complex Band Spectra in Deformed Nuclei, D.A.E., 1986-1989.
2. **P.I.**, Study of one and many-quasiparticle states, D.A.E., 1990-1994.
3. **P.I.**, Multifaceted Study of the Deformed Nuclei, D.S.T., 1996-2001.
4. **P.I.**, Nuclear Structure of Some Rare Nuclear Phenomena, D.S.T., 2000-2004.
5. **Co- P.I.**, Semi-classical Methods in Nuclear Physics, D.A.E., 1999-2003.
6. **P.I.**, Improved decay data for tuning and testing of nuclear structure models, I.A.E.A, 2003-2007.
7. **Co-Investigator**, National Project on Indian National Gamma Array (INGA), D.S.T., 2005-2009 sanctioned at IUAC, New Delhi.
8. **P.I.**, Nuclear Structure Studies of Multi-Quasiparticle States and Nuclear Isomers, D.S.T., 2010-2014.
9. **P.I.**, Improved Nuclear Structure and Decay Data for Nuclear Models in the Heavy Nuclides Region, BRNS-DAE, 2011-2014.
10. **P.I.**, New Initiatives and Support for activities in Nuclear Theory and related areas, BRNS-DAE, 2014 (Sanctioned).

(DAE- Dept. of Atomic Energy, DST-Dept. of Science & Technology, Govt. of India,
IAEA- International Atomic Energy Agency)

Other Professional Activities:

1. **Coordinator, Nuclear Data Center** at the Indian Institute of Technology, Roorkee, under the auspices of the *International Atomic Energy Agency, Vienna*. This is a part of the International Network of Nuclear Structure and Decay Data Evaluators.
<http://www-nds.iaea.org/nsdd/>
2. Established the Virtual Center for Nuclear Theory, www.cnt.net.in
3. **Present Research Collaborations:**
National - IUAC, New Delhi; T.I.F.R. Mumbai; B.A.R.C., Mumbai; Delhi University; G.N.D. University; G.G.U., Bilaspur.
International - McMaster University; Centro de Física das Interações Fundamentais (CFIF), Departamento de Física, Instituto Superior Técnico (IST), Lisbon; Argonne National Lab, USA.

Recent Significant Administrative assignments at IIT Roorkee:

1. **Head**, Department of Physics, IIT Roorkee, Jan 2011 – April 2014.
2. **Chairman**, Standing Committee on Radiological Materials, since 2010.
3. **Convener**, Institute Lecture Series, IIT Roorkee, since 2010.
4. **Member**, Group Purchase Committee, SRIC, since 2009.
5. **Member**, Educational Planning and Research Committee, IITR until 2011.
6. **Chairman**, Department Research Committee, 2008-April 2010.
7. **Member**, Institute Library Advisory Committee, IITR, 2008-2010.
8. **Member**, Institute Lecture Series, IITR, 2006-2009.
9. **Chairman**, Department Purchase, Finance & Store Committee, 2005-2008.
10. **Member**, Strategic Planning Group, IIT Roorkee, 2002-2006.

Symposia/Workshops/Schools Organized:

1. **Convener**, Second National Workshop on Nuclear Structure Physics, Roorkee, 7-10 Feb. 1995.
2. **Convener**, National Workshop on Nuclear Structure and Dynamics, Roorkee, 21-23 Aug. 1999.
3. **Coordinator**, Orientation Program on Exotic Decays and Shell Model, 21 Dec. 2008.
4. **Local Convener**, DAE Symposium on Nuclear Physics, Roorkee, 22-26 Dec.2008.
5. **Chairman**, School cum Workshop on Nuclear Yrast and Near-Yrast spectroscopy, I.I.T.,Roorkee, 26-30 October 2009.
6. **Convener**, Interaction meeting on “Theoretical Nuclear Physics”, D.S.T., held at IIT Roorkee, September 3-5, 2010.
7. **Chairman**, Planning Committee meeting on SERC Schools in Nuclear Physics, held at IIT Roorkee, March 17, 2011.
8. **Director**, S.E.R.C. (D.S.T.) School on Modern Trends in Nuclear Structure and Dynamics, held at IIT Roorkee, Feb. 6-24, 2012.
9. **Chairman**, National Conference on Advances in Physics, Feb. 25-26, 2012, held at IIT Roorkee.
10. **Chairman**, Golden Jubilee Alumni meet & Mini Workshop, 31 March, 2012, held at Physics Department, IIT Roorkee.
11. **Co-Chair**, International Conference on Recent Trends in Nuclear Physics, November 19-21, 2012, held at Chitkara University, Barotiwala, Solan (H.P.).

Professional Society Membership:

1. Life Member, Indian Physics Association.
2. Life Member, Indian Science Congress Association
3. Life Member, Indian Association of Physics Teachers
4. Founding Member, International Foundation for India's Heritage (IFIH)
(www.ifih.org)

Doctoral Student Thesis Direction:

1. **K. Jain**, 1987, New features in rotational bands of odd-A nuclei.
2. **A. Goel**, 1992, Study of 2qp band structures in odd-odd and even-even nuclei.
3. **M. Dudeja**, 1998, Application of Semiclassical Methods to Deformed and Superdeformed Nuclei.
4. **A. Rastogi**, 2001, Shears Mechanism in Magnetic Rotational Bands.
5. **Priyanka Agarwal**, 2007, Magnetic Rotation in Nuclei of A=80 and A=130 Mass Region
6. **Suresh Kumar**, 2008, Study of Shape Effects and Magnetic Rotation in N=79 and 47 Nuclei
7. **Sukhjeet Singh**, 2008, High Spin Features of Odd-A Nuclei using 3QP plus Rotor Model
8. **Deepika Choudhury**, 2012, Study of new coupling schemes in nuclei in A=110 and 135 mass regions.
9. **Monika Patial**, 2013, Proton radioactivity from 2qp states.
10. **Neha Sharma**, 2013, Some universal features and global systematic of Super-deformed bands.
11. **Pooja Devi**, in progress since 2009, Study of air-moisture dynamics at local and regional scale using Isotope techniques (to be submitted in a month).
12. **Bhoomika Maheshwari**, in progress since 2011, Nuclear Isomers and Fission Isomers
13. **Swati Garg**, in progress since 2013, Isospin dependence in Nuclear Fission

Awards, Honors and Recognitions in last decade:

1. Convener of Nuclear Physics, Vision Meeting on High Energy, Nuclear and Accelerator Physics, jointly under DST and DAE, held at BARC, Mumbai, 24-25 August 2014.
2. Member, International Advisory Committee, Workshop on Science with RIB, VECC, Kolkata, 25-28 Nov. 2014.
3. Member, National Advisory Committee, DAE Symposium on Nuclear Physics, BHU, 8-12 Dec. 2014.
4. Member, National Advisory Committee, Winter School on Nuclear Astrophysics, VECC, Kolkata, 19-31 Jan 2015.
5. Member, National Advisory Committee, Conf on Frontiers in Gamma Ray Spectroscopy, VECC, Kolkata, 18-20 Feb. 2015.
6. Member, Cyclotron Users Committee, Variable Energy Cyclotron Centre (DAE), Kolkata, since 2013.
7. Patron, Indian Association of Physics Teachers, Regional Chapter, Uttarakhand, since 2013.
8. Member, International Advisory Committee, ND2013 - International Conference on Nuclear Data for Science & Technology, NNDC, Brookhaven Natl. Lab, USA.
9. Member, International Advisory Committee, International Symposium on Nuclear Physics (DAE), 2013.
10. Member, Board of Studies, Thapar University, Patiala, since 2013.
11. Member, Program Review Committee, Nuclear Data Physics Centre of India, BRNS-DAE, Mumbai, 2012-continue.
12. President, Indian Physics Association, Roorkee Chapter, 2011-2013,
13. Chairman, Planning Committee of SERC (DST) Schools in Nuclear Physics and Nuclear Theory since 2010.
14. Mentor, INSPIRE program, DST, Govt. Of India, since 2010.
15. Chairman, Steering Committee for the proposal on Centre for Nuclear Theory, 2010.
16. Member, Management Advisory Committees for Major Research Projects (DST) at IUAC, New Delhi.
17. Member, Governing Body, L.M.S. PG (Autonomous) College, Rishikesh, 2010-2012.
18. Member, Advisory Committee, Nucleus-Nucleus Collision around Fermi energies, VECC, Kolkata, 16-17 Dec. 2010.
19. Member, Program Advisory Committee, (Plasma, High Energy, etc.), D.S.T., 2004-2007.
20. Member, Planning Committee on SERC Schools in Nuclear Physics, 2005-2010.
21. Member, International Network of Nuclear Structure Decay Data Evaluators (IAEA, Vienna), since 2004.
22. Awarded by IIT, Roorkee as “**Star Performer**” in teaching and research, 2004.
23. D.A.E. Golden Jubilee Lecture at Institute of Physics, Bhubaneswar, March, 2004.
24. Member, D.S.T. Review Committee for Nuclear Science Centre, New Delhi, 2004.
25. Invited Lecturer at S.E.R.C Schools in Nuclear Physics (D.S.T.), held at Puri, **1996**; Chandigarh, **2002**; Mumbai, **2004**; and New Delhi, **2008**.
26. Associate, Nuclear Science Centre, New Delhi, 2005-2008.
27. Observer, International Committee of Nuclear Structure and Decay Data Evaluators, I.A.E.A., Vienna, 2003, and 2004.
28. Member, Dept. of Science & Technology (Govt. of India), Expert Committee to evaluate major nuclear physics proposals, 1998-2003.
29. Member, International Working Group of Physics and Astronomy, SSQ Project, Univ. of California, Berkeley, USA, 2000-2003.
30. Elected Member, Senate, Univ. of Roorkee, 1999-2002.
31. Convener, Theoretical Physics Seminar Circuit (DST), Roorkee Centre, 2000-2002; 2007-2010.
32. Theoretical Physics Seminar Circuit Speaker, 1994-95, 1998-2000 and 2004-2006, awarded under Dept. of Science and Technology.
33. Associate Member, Scientific Advisory Committee, Nuclear Science Centre, New Delhi.
34. Chairman, Accelerator User’s Committee, Nuclear Science Centre, New Delhi, 2000-2002.
35. Member, Governing Board and Governing Council, Nuclear Science Centre, New Delhi, 2000-2002.

Recent Conferences/Workshops (last 10 years):

1. AASPP Workshop on Nuclear Reaction Database Development, BARC, Mumbai, 22-24 Sept. 2014.
2. DAE-DST Vision Meeting, BARC, Mumbai, 24-25 Aug. 2014.
3. 33rd International Workshop on Nuclear Theory, Rila Mountains, Sofia, Bulgaria, 22-28 June 2014.
4. School on Nuclear Fission, VECC, Kolkata, 13-24 May 2014.
5. International Conference on 75 years of Nuclear Fission, BARC, Mumbai, 8-10 May 2014
6. Asian Nuclear Physics Association Workshop, VECC, Kolkata, 19-21 Feb. 2014.
7. International Symposium on Nuclear Physics, BARC, Mumbai, 2-6 Dec. 2013
8. Meeting of SERC Schools and Orientation program for Students, Karnataka University, Dharwad, 8-9 Nov. 2013.
9. DST-SERC School on Nuclear Reactions, IIT Roorkee, 23 Sept – 4 Oct, 2013
10. 32nd International Workshop on Nuclear Theory, Rila Mountains, Sofia, Bulgaria, 22-28 June 2013.
11. Conference on Particle Accelerators: Technology & Applications, IUAC, New Delhi, 4-5 April, 2013.
12. International conference on Nuclear Data “ND2013” in Brookhaven National Laboratory, Upton, New York, USA during 4-8 March, 2013.
13. 20th meeting of International Network of Nuclear Structure and Decay Data Evaluators, from 27–31 January, 2013, in KFAS, Kuwait
14. DAE Symposium on Nuclear Physics, Delhi University, 3-7 Dec., 2012.
15. Workshop on Evaluation of Nuclear Structure and Decay Data to be held at Variable Energy Cyclotron Centre, Kolkata from 26-29 November, 2012
16. International conference “Nuclear Structure 2012”, USA, 13 -17 August, 2012.
17. Workshop on “Frontiers in Gamma Ray Spectroscopy”, IUAC, New Delhi, 6-8 March, 2012.
18. QIP Workshop on “Perspectives on Research Methodology: Papers & dissertation”, Department of HSS, IIT Roorkee, 13-14 Jan., 2012.
19. DAE Symposium on Nuclear Physics, Andhra Univ., Visakhapatnam, 26-30 Dec., 2011.
20. ANUP Workshop and School, Goa, 7-18 Nov., 2011.
21. Workshop on “Advances in Physics and Role of Experiments in Physics Teaching”, Gurukula Kangri Vishwavidyalaya, Haridwar, 05 Nov., 2011.
22. Workshop on “Frontiers of Nuclear Data Physics and Related Applications”, Jeddah, Saudi Arabia, 10-12 Sept., 2011.
23. International Network of Nuclear Structure and Decay Data Evaluators Meeting, I.A.E.A., Vienna, 4-8 April, 2011.
24. Nuclear Physics Symposium (D.A.E.), B.I.T.S., Pilani, 20-24 Dec. 2010.
25. International Workshop on NN Interaction and the Many Body Problem, Nov. 18-27, 2010, T.I.F.R., Mumbai.
26. National Seminar on Contemporary Trends in Nuclear Physics, A.M.U., Aligarh, 20-21 October 2010.
27. INSPIRE Science Camp, HNB Garhwal University, Srinagar, UK, 3-4 Dec, 2010.
28. Workshop on “Physics with FAIR: Indian perspective”, V.E.C.C., Kolkata, 8-9 March 2010.
29. International Nuclear Physics Symposium, B.A.R.C., Mumbai, 8-12 Dec. 2009.
30. INS National Seminar on “Nuclear Technology for Sustainable Development”, Thapar University, Patiala, 10-11 Oct. 2009.
31. Specialists’ Meeting on Advances in Scientific Databases in India, I.G.C.A.R., Kalpakkam, 10-11 August 2009.
32. International Network of Nuclear Structure and Decay Data Evaluators, I.A.E.A., Vienna, 22-27 March 2009.
33. Nuclear Physics Symposium (D.A.E.), I.I.T. Roorkee, 22-26 Dec. 2008.
34. Nuclear Physics Symposium (D.A.E.), at BARC, Mumbai, 8-12 Dec. 2003; at Varanasi, 8-12 Dec. 2004; at Baroda, 8-12 Dec. 2006.
35. International Conference on Proton Emitting Nuclei and related topics, Lisbon, June 17-23, 2007.
36. Nuclear Structure – 2008, Michigan State University, East Lansing, Michigan, 3-6 June 2008.
37. International Network of Nuclear Structure and Decay Data Evaluators, 10-14 Nov.2003, IAEA, Vienna; 6-10 June 2005, McMaster University, Canada; 11-15 June 2007, St. Petersburg, Russia; Vienna, 22-27 March 2009.
38. International Workshop on Nuclear Structure, Shimla, India, March 2005.
39. DAE-BRNS National Workshop on Nuclear Data for Reactor Technology and Fuel Cycle, 7-10 March 2005, B.A.R.C., Mumbai.
40. Workshop on Nuclear Structure and Decay Data, I.A.E.A., Vienna, 18-22 Nov. 2002; 10-14 Nov. 2003.
41. International Conference on Science and Beyond, N.I.A.S., Bangalore, 8-11 Jan. 2003.
42. Workshop on Nuclear Physics with Indian National Gamma Array, N.S.C., New Delhi, Sept. 16, 2003.
43. International Workshop on Nuclear Structure: Theory and Data Evaluations, I.C.T.P., Trieste, Nov. 17-28, 2003.

Recent Invited Talks and Lectures:

- **A.K. Jain**, Invited talk at the AASPP Workshop on Nucl. Reaction Database Development, BARC, Mumbai, 22-24 Sept. 2014.
- **A.K. Jain**, Invited talk at the 33rd International Workshop on Nuclear Physics, Sofia, Bulgaria, 22-28 June 2014.
- **A.K. Jain**, Invited talk at the 75th year of Fission, BARC, Mumbai, 8-10 May 2014.
- **A.K. Jain**, Lectures at the School on Nuclear Fission, VECC, Kolkata, 13-15 May 2014.
- **A.K. Jain**, Invited talk at the 32nd International Workshop on Nuclear Physics, Sofia, Bulgaria, 23-29 June 2013.
- **A. K. Jain**, Some recent results and future directions for nuclear structure studies in India, April 4-5, 2013. Conference on Particle Accelerators: Technology & Applications, IUAC, New Delhi, 4-5 April, 2013.
- **A. K. Jain**, Hundred years of Rutherford Scattering in Nuclear Physics, INSPIRE program, Thapar University, Patiala, March 31, 2013.
- **A.K. Jain**, Invited Lectures at Jammu University, 10-11 March 2013.
- **A. K. Jain**, Talk on "Conservation of Isospin in n-rich fission fragments", International Conf on Nuclear Data for Science & Technology, New York, March 4-8, 2013.
- **A. K. Jain**, Talk on "Horizontal evaluation – Nuclear Isomers", IAEA Meeting of NSDD evaluators, KFAS, Kuwait, Jan. 27-31, 2013.
- **A. K. Jain**, Invited talk on "Nuclear Theory for the experimentalists and evaluators", BRNS Workshop on Nuclear Structure and Decay Data, VECC, Kolkata, Nov. 26-30, 2012.
- **A. K. Jain**, Invited talk on "Role of Isospin conservation in n-rich nuclei", SCRIBE, VECC, Kolkata, Nov. 7-9, 2012.
- **A. K. Jain**, Hundred years of Rutherford Scattering in Nuclear Physics, INSPIRE program, HNB University, Srinagar Garhwal, Dec. 4, 2010.
- **A.K. Jain**, Conservation of Isospin in the Fission of Heavy Nuclei, International Workshop on NN Interaction and the Many Body Problem, Nov. 18-27, 2010, T.I.F.R., Mumbai.
- **A. K. Jain**, Atlas of Nuclear Isomers and their systematics, International Network of Nuclear Structure and Decay Data Evaluators, I.A.E.A., Vienna, April 4-8, 2011
- **A. K. Jain** – Invited Talk on "Semiclassical Approaches to Phenomena in Deformed Nuclei", Workshop on "Frontiers in Gamma Ray Spectroscopy", T.I.F.R., Mumbai, 2-4 March 2009.
- **A.K. Jain** – Invited Talk on "*Magnetic Rotation - Past, Present and Future*", International Nuclear Physics Symposium, B.A.R.C., Mumbai, 8-12 Dec. 2009.
- **A. K. Jain** – Invited Lecture on "*Geometrical Symmetries and Level Structure*", School cum Workshop on Nuclear Yrast and Near-yrast States, IIT, Roorkee, 26-30 Oct. 2009.
- **A. K. Jain** – Invited Talk on "*Some exotic phenomena in nuclei*", INS national Seminar on "Nuclear Technology for Sustainable Development", Thapar University, Patiala, Oct. 10-11, 2009.
- **A. K. Jain** – Invited Lecture on "*Particle Physics – Existence and Eternity*", Course on Synergy through Self-Awareness and Personal mastery, National Academy of Direct Taxes, Nagpur, 14-16 Sept 2009.
- **A.K. Jain** – Lecture series on "Basic Properties of Nuclei" (a set of six lectures), SERC School on Nuclear Physics, IUAC, New Delhi, 1-20 September 2008.
- **A.K. Jain** – Lecture series on "Symmetries and Nuclear Spectra" (a set of six lectures), SERC School on Nuclear Physics, IUAC, New Delhi, 1-20 September 2008.
- **A.K. Jain** – Invited talk on "Recent Developments in Nuclear Structure Theory" at Seminar on "Recent Trends in Physics", Panjab Univ, Chandigarh, Feb 29, 2008.
- **A.K. Jain** – Invited talk at the International Conference on Proton Emitting Nuclei and related topics, Lisbon, June 17-23, 2007.
- **A.K. Jain**, S.S. Malik and S.R. Jain, Invited Talk "*Semiclassical Route to Shell Model*", International Workshop on "Nuclear Structure Physics at the Extreme; New Directions", Shimla, India, 21-24 March 2005.
- **A.K. Jain** and Mohini Gupta, Invited talk "*ENSDF – Purpose, Philosophy and Usage*", at DAE-BRNS National Workshop on Nuclear Data for Reactor Technology and Fuel Cycle, 7-10 March 2005, B.A.R.C., Mumbai.
- **A.K. Jain**, Invited lecture "*Magnetic Phenomena in Nuclei*", in the D.A.E. Golden Jubilee Lecture Series at the Institute of Physics, Bhubaneswar, March 10, 2004.
- **A.K. Jain** and P. Arumugam, Lectures entitled "*Shell Structure, Cranking and Magnetic Phenomena in Nuclei*", at S.E.R.C School in Nuclear Physics (Dept. of Science & Technology, Govt. of India), IIT, Mumbai, 2004.

Experimental/Laboratory Experience:

Prof. Jain was trained as a theorist but quickly acquired experimental skills as he had to develop and maintain a nuclear physics lab at Roorkee. He introduced new and advanced experiments in the nuclear physics teaching lab, maintained it well and developed the manual. He introduced new experimental techniques like the Solid State Track detectors, gas flow detectors etc and guided a large number of M.Sc. projects based on these facilities.

Prof. Jain has also taught courses at Kuwait University where he became extremely popular with the students. He also spent a brief period at the Yangon University in Myanmar under a government program. He revived the completely defunct nuclear physics lab at Yangon university within a period of two months. He also revived the 14 MeV neutron generator at Yangon single handedly and obtained the neutron beam for experimental work.

This combination of theoretical and experimental skills is not very common and propelled the nominee to take up experimental research work also. He has guided several Ph.D.s, which are largely experimental in nature.

Summary of Scientific Contributions of Professor A. K. Jain

Professor Jain has made many significant and original contributions in several areas of Nuclear Structure Physics in general and Physics of Deformed and Nearly Deformed Nuclei in particular, a brief account of which is outlined below. Prof. Jain is considered as one of the top leaders in the field as evidenced by the citations and large number of invited talks and lectures delivered in national and international conferences/workshops/schools. He is a member of the International Network of Nuclear Structure Decay Data Evaluators (IAEA), and has also served on the advisory committees of a number of national and international conferences.

- 1. Identical Bands in Normal Deformed Nuclei:** Band structure of each nucleus is expected to be unique. It is, therefore, very unusual that two nuclei should display identical bands. Many examples of identical bands in odd-A deformed nuclei were discovered by the nominee for the first time in 1984 (*Z. Physik A317*, 2050, 1984; *Phys. Rev. C30*, 2050, 1984). It was followed up by him through his observations of identical band structures in groups of nuclei (*Z. Physik A320*, 645, 1985; *Modern Physics Letters A3*, 743, 1988) and explained in terms of multiplets of F-spin and SU(7) group. He showed many examples of this in the rare-earth region (*REVIEWS OF MODERN PHYSICS* 62, 393-509, 1990) and the actinide region (*At. Data & Nucl. Data Tables* 50, 269-342, 1992). Later on, this phenomenon became very well known in the context of super-deformed bands. This discovery has been credited to him in the review article on Identical bands (*Ann. Rev. Nucl. Part. Sci.* 45, 485, 1995) and also discussed at length in the lectures of R. F. Casten at XVIII Summer School on Nuclear Structure Studies at Mikolajki, Poland, 1986.
- 2. Nuclear Structure of ODD-A Deformed Nuclei:** The Nilsson model has played an important role in the understanding of the structure of deformed nuclei. He has made many contributions to the understanding of Odd-A nuclei by using this model. He has examined the single particle states in deformed nuclei and carried out a detailed comparison with the Nilsson model and its extension to octupole shapes. These contributions have been comprehensively covered in his article in the Reviews of Modern Physics (*REVIEWS OF MODERN PHYSICS* 62, 393-509, 1990). This article is now taken as a standard reference in the nuclear data evaluation (Nuclear Data Sheets, first issue of each volume).
- 3. Nuclear Structure of ODD-ODD Deformed Nuclei:** The band structure of odd-odd nuclei is much more complex than odd-A nuclei. One would expect a more regular rotational pattern in the odd-odd nuclei due to diminished pairing correlations. However, he discovered for the first time the existence of an odd-even staggering in the K^- rotational bands of odd-odd nuclei. He explained this phenomenon in terms of higher order Coriolis effects (*Phys. Lett. B209*, 19, 1988; *Phys. Rev. C40*, 432-444, 1989). Further, the phenomenon of Signature inversion in odd-odd nuclei was also explained by him in terms of higher order Coriolis effects (*Physics Letters B277*, 233-237, 1992 and *Nuclear Physics A620*, 265, 1997). These contributions of Prof. Jain and his coworkers culminated in the publication of the second review by the nominee in the prestigious Reviews of Modern Physics in 1998 (*REVIEWS OF MODERN PHYSICS* 70, 1998, 843-895). His two articles in Atomic and Nuclear data Tables in 1998 (*Atomic Data & Nuclear Data Tables*, 69, 239-348, 1998; 69, 239-348, 1998) cover all the data in the medium-heavy mass odd-odd nuclei along with the configuration assignments.
- 4. Many-Quasiparticle States:** Prof. Jain's work on the odd-odd nuclei (which largely exhibit $2qp$ n-p states) was further extended to more complex states like two and three quasiparticle

(2qp, 3qp) states and multi quasiparticle states in even-even and odd-A nuclei. He observed a new phenomenon of signature reversal in 2qp states of some even-even nuclei and also explained it in terms of higher order Coriolis effects (*Physics Letters B337, 240-244, 1994*). The G-M rules applicable to odd-odd nuclei were generalized by him to three quasi-particle states and a model was proposed for the same (*Physical Review C45, 3013-3016, 1992; Physical Review C75,067301,2007*). Prof. Jain and coworkers have recently developed a model for the three-quasi-particle states (3qp plus rotor model) which is being used to understand the high spin features of the 3qp bands (*At. Data Nucl. Data Tables 92, 1, 2006; Phys. Scr. T125, 186, 2006*).

5. **Superdeformed Bands:** Experimental observation of the high spin superdeformed (SD) bands was one of the most surprising discoveries in nuclear structure physics in the last decade of the 20th century. These bands display some very unusual properties like near rigid-rotor behaviour and total disconnectedness with normal level structures. Prof. Jain and coworkers have pointed out many new features of the SD bands like a weak oscillation in the gamma ray energies, and negative alignment (*J. Korean Phys. Sec. 29, S361-S365, 1996; Physics Letters B412, 14-18,1997*).
6. **Semi-classical Methods in Nuclear Structure Physics:** Prof. Jain and coworkers have successfully used the semi-classical methods in high spin phenomena like SD bands. A semi-classical analysis of the conventional models such as the Particle-Rotor model and the Cranking model has been carried out and several new features have been pointed out (*Phys. Lett. B392, 243-248, 1997; Phys. Lett. B370, 1, 1996*). In particular, a large starting spin for the band-head of the SD bands, weak oscillations and no linking transitions to normal states were shown to be closely related to the non-linearity of the model Hamiltonian and the ensuing second order phase transition(*Int. J. Mod. Phys. E9, 487-506, 2000*). Prof. Jain and coworkers have also used the new and powerful technique of the Periodic Orbit Theory (POT) to understand the dynamics of deformed nuclei. A complete periodic orbit theory of deformed systems has been worked out and the role of three dimensional periodic orbits has been emphasized in the context of SD bands (*Int. J. Mod. Phys. E11, 1-17, 2002*).
7. **Magnetic Rotation:** It was a big surprise when well developed rotational bands were seen in many Pb isotopes which are nearly spherical in nature. The levels of the bands were strongly linked by magnetic transitions rather than electric transitions. It has now been recognized that this rotation is not of the charge density as in deformed nuclei but is rather of currents (a magnetic top). Prof. Jain and coworkers have completed a survey of this area and identified as many as 178 candidates for the magnetic rotation (MR) bands all across the chart of nuclides (*Atomic Data & Nuclear Data Tables, 74, 283-331 (2000); <http://www.nndc.bnl.gov/publications/preprints/mag-dip-rot-bands.pdf>, 2007*). They have used the particle-rotor model as well as the self-consistent Tilted Axis Cranking model in pursuing a theoretical understanding of this phenomenon. He has also started an experimental program in this area and *has been successful in discovering many new MR bands along with new features like shape mixing, and crossing of two magnetic bands* (*Nucl. Phys. A732, 13 (2004); Nucl. Phys. A761, 1-21 (2005); Phys. Rev. C69, 014319 (2004); Phys. Rev. C66, 041303 (Rapid Comm.), 2004*).
8. **Anti-magnetic Rotation (AMR) bands in odd-A nuclei:** In analogy to anti-ferromagnetism in solids, Frauendorf proposed an arrangement of the proton and neutron spins so that the two pair of nucleons form a back to back shears with almost zero magnetic moment. The configuration is symmetric for rotation by 180 about the total angular momentum leading to a rotational band differing in spin by 2 units of spin. He discovered *the first example of this phenomenon, called anti-magnetic rotation (AMR), in an odd-A nucleus, ¹⁰⁵Cd* (*Phys. Rev.*

C82, 061308, Rapid Comm, 2010). Following this further, he has recently reported *the first example of multiple AMR bands in ^{107}Cd* (*Phys. Rev. C87, 034304, 2013*). These discoveries have opened the possibility of more such bands in odd-A nuclei.

9. **Nuclear Isomers:** Prof. Jain has initiated a **new program of research in nuclear isomers** across the nuclear chart, particularly focused on the medium-heavy and heavy mass nuclei. A model is being devised to predict the existence of nuclear isomers in the non-yrast and far from the stability region. An Atlas of Nuclear Isomers is ready for publication, a first of its kind. It is expected that the study will lead to a capability of making reliable predictions of isomers. One can then look for isomers which can have useful practical applications.
10. **Proton Emitting Nuclei:** Prof. Jain and his group have proposed for the first time a complete model for the study of odd-odd proton emitters. This work published recently has been highlighted by the editor of Phys. Rev. C of particular importance. (**Nonadiabatic quasiparticle approach for deformed odd-odd nuclei and the proton emitter ^{130}Eu** , Monika Patial, P. Arumugam, A. K. Jain, E. Maglione, L.S. Ferreira, Phys. Rev. C88, 054302- Published 4 November 2013). This model will be expected to find many applications.

Other Social activities of Prof. A.K. Jain:

1. Secretary and Trustee, Shri Ganesh Varni Sansthan, Varanasi.
An institution engaged in publication and research on Jain Philosophy. More than 50 authentic books have been published.
2. Chairman, S.P.P.S. Foundation, Roorkee.
An institution engaged in publications on the interface of Jainism and its relationship to other philosophies as well as dialogue of science and spiritual quest. Also organizes lectures and provides financial assistance.
3. Chairman, NAMAN- A Foundation for Children, Roorkee.
An organization engaged in philanthropic activities for children. It awards prizes and provides financial help to needy children.

Books/Articles published in the area of Jainism/ Karma Theory:

1. **Satkhnadagama – Dhavala** (Jivasthana) – Book One
English Translation : N. L. Jain
Editor : A. K. Jain, pp.335, 2004.
2. **Panditji** – A biographical sketch of the great scholar Pandit Phool Chandra Shastri
Editors: P.C. Jain, A.K. Jain, K.C. Jain, Neerja Jain
pp. 240, 2004.
3. **Scientific Content in the exploration of the Spiritual World in the Jain Tradition**
A. K. Jain
in *Science and Beyond: Cosmology, Consciousness and Technology in the Indic Traditions*
Editors: S. Menon, B.V. Sreekantan, A. Sinha, P. Clayton, R. Narsimha, pp.86-97,
National Institute of Advanced Studies, Bangalore, India, 2004

Invited Talk:

- **A.K. Jain**, Invited talk on “Scientific Content in the exploration of the Spiritual World in the Jain Tradition” at International Conference on Science and Beyond, National Institute of Advanced Studies, Bangalore, 8-11 Jan. 2003.

CITATION INDEX OF SOME PUBLICATIONS OF Prof. A.K. Jain

1. **Single-Particle States of Odd-A Deformed Nuclei in the Region($151 \leq A \leq 195$) and ($A \geq 221$)**
A.K. Jain, R.K. Sheline, P.C. Sood and Kiran Jain
REVIEWS OF MODERN PHYSICS 62, 1990, 393-509 (Cited: 185)
Impact factor of RMP: 32.7
2. **Nuclear Structure in Odd-Odd Nuclei, $144 \leq A \leq 194$**
A.K. Jain et al.
REVIEWS OF MODERN PHYSICS 70, 1998, 843-895 (Cited: 62)
Impact factor of RMP: 32.7
3. **Table of Magnetic Dipole Rotational Bands**
Amita Rastogi, A.K. Jain and B. Singh
Atomic Data and Nuclear Data Tables 74, 2000, 283-331 (Cited: 43)
Impact factor of ADNDT: 2. 79
4. **Shape Transition and Tilted Axis Rotation in ^{136}Ce**
S. Lakshmi, H.C. Jain, P.K. Joshi, Amita, Priyanka Agarwal, A.K. Jain and S.S. Malik
Physical Review C66, 2002, 041303 (Rapid Comm) (Cited: 18)
Impact factor of PRC: ~3
5. **Nonlinear Dynamics of High-j Cranking Model: A Semiclassical Approach**
Sudhir R. Jain, Ashok K. Jain and Zafar Ahmed
Physics Letters B370, 1996, 1-4 (Cited: 11)
Impact factor of PLB: ~3.5
6. **Mechanism of Signature Inversion In Odd-odd Rotational Bands**
A.K. Jain and Alpana Goel
Physics Letters B277, 1992, 233-237 (Cited: 28)
Impact factor of PLB: ~3.5
7. **An Empirical Model for Three-Quasiparticle states**
Kiran Jain and Ashok K. Jain
Phys. Rev. C45, 1992, 3013-3016 (Cited: 16)
Impact factor of PRC: ~3
8. **Coriolis Coupling in the Rotational Bands of Deformed Odd-odd Nuclei**
A.K. Jain, J. Kvasil, R.K. Sheline and R.W. Hoff
Physical Review C40, 1989, 432-444 (Cited: 46)
Impact factor of PRC: ~3
9. **Reflection Asymmetric and Symmetric Shapes in ^{225}Ra ; Polarisation Effect of Odd Particles**
R.K. Sheline, A.K. Jain, Kiran Jain and I. Ragnarsson
Physics Letters B219, 1989, 47-51 (Cited: 14)
Impact factor of PLB: ~3.5
10. **Odd-Even Staggering in the $K=1, 2, 3$ and 4 Rotational Bands of Deformed Odd-Odd Nuclei**
A.K. Jain, J. Kvasil, R.K. Sheline and R.W. Hoff
Physics Letters B209, 1988, 19-22 (Cited: 18)
Impact factor of PLB: ~3.5
11. **Possible Octupole Deformation in Cs and Ba Nuclei from their Differential Radii**
R.K. Sheline, A.K. Jain and Kiran Jain
Physical Review C38, 1988, 2952-2954 (Cited: 24)
12. **Evidence of Anti-magnetic Rotation in Odd-A ^{105}Cd**
D. Choudhury, A.K. Jain et al.
Phys. Rev. C82, 2010, 061308 (Rapid Comm) (Cited 15)

List of Publications of Prof. A. K. Jain

Books:

1. **Nuclear Structure and Dynamics**
Editors: Ashok K. Jain and Ranjan K. Bhowmik
(Phoenix Publications, New Delhi, 2000).
2. **Proceedings of the Second National Workshop on Nuclear Structure Physics**
Editors: Surya N. Chintalpudi and Ashok K. Jain,
(Inter-Univ. Consortium of DAE Facilities, Calcutta, 1995).
3. **Proceedings of International Conference on Recent Trends in Nuclear Physics-2012**
Editors: Sushil Kumar and A.K. Jain
(American Institute of Physics Conf. Proc. 1524, N.Y., 2013)

A. Major Papers:

4. **Intrinsic States of Deformed Odd-A Deformed Nuclei in the Mass Regions ($151 \leq A \leq 193$) and ($A \geq 221$)**
A.K. Jain, R.K. Sheline, P.C. Sood and Kiran Jain
REVIEWS OF MODERN PHYSICS 62, 1990, 393-509.
5. **Rotational Bands in Deformed Odd-A nuclei in the Actinide region**
Kiran Jain and A.K. Jain
Atomic Data and Nuclear Data Tables 50, 1992, 269-342.
6. **Nuclear Structure in Odd-Odd Nuclei, $144 \leq A \leq 194$**
A.K. Jain, R.K. Sheline, D. Headly, P.C. Sood, D. Burke, I. Hrivnacova, J. Kvasil, D. Nosek, and R.W.Hoff
REVIEWS OF MODERN PHYSICS 70, 1998, 843-895.
7. **Intrinsic Structure and Associated Rotational Bands in Medium-Heavy Deformed Odd-Odd Nuclei: I**
D.N. Headly, R.K. Sheline, P.C. Sood, R.W. Hoff, A.K. Jain and D.G. Burke
Atomic Data and Nuclear Data Tables 69, 1998, 239-348.
8. **Intrinsic Structure and Associated Rotational Bands in Medium-Heavy Deformed Odd-Odd Nuclei: II. Update Supplement**
B.Singh, P.C. Sood and A.K. Jain
Atomic Data and Nuclear Data Tables 69, 1998, 349-358.
9. **Table of Magnetic Dipole Rotational Bands**
Amita Rastogi, A.K. Jain and B. Singh
Atomic Data and Nuclear Data Tables 74, 2000, 283-331;
<http://www.nndc.bnl.gov/publications/preprints/mag-dip-rot-bands.pdf> (2006).
10. **Table of Three-Quasiparticle Rotational Bands in Deformed Nuclei, $153 \leq A \leq 187$**
S. Singh, S.S. Malik, A.K. Jain, and B. Singh
Atomic Data and Nuclear Data Tables 92, 2006, 1-46.

Nuclear Structure Decay Data Evaluation

- 11. Nuclear Data Sheets for A=165**
A.K. Jain, Anwesha Ghosh, Balraj Singh
Nuclear Data Sheets 107, 2006, 1075-1346.
- 12. Nuclear Data Sheets for A=218**
A.K. Jain and Balraj Singh
Nuclear Data Sheets 107, 2006, 1027-1074.
- 13. Nuclear Data Sheets for A=251**
J.K. Tuli, S. Singh, and A.K. Jain
Nuclear Data Sheets 107, 2006, 1347-1392.
- 14. Nuclear Data Sheets for A=253**
A.K. Jain, S. Singh and J.K. Tuli
Nuclear Data Sheets 107, 2006, 2103-2129.
- 15. Nuclear Data Sheets for A=221**
A.K. Jain, S. Singh, S. Kumar and J.K. Tuli
Nuclear Data Sheets 108, 2007, 1-36.
- 16. Nuclear Data Sheets for A=225**
A.K. Jain, R. Raut, and J.K. Tuli
Nuclear Data Sheets 110, 2009, 1409.
- 17. Nuclear Data Sheets for A=222**
S. Singh, A.K. Jain, and J.K. Tuli
Nuclear Data Sheets 112, 2011, 2851.
- 18. Nuclear Data Sheets for A=139**
P. Joshi, B. Singh, S. Singh and A.K. Jain
Nuclear Data Sheets (2014) to be published
- 19. Nuclear Data Sheets for A=215**
S. Singh, A.K. Jain, and J.K. Tuli
Nuclear Data Sheets 114, 2013, 2023.

B. Papers in journals/books:

- 20. 6 + isomers in neutron-rich Sn-isotopes beyond N=82 and effective interaction**
Bhoomika Maheshwari, Ashok Kumar Jain, and P. C. Srivastava
Phys. Rev. C (accepted for publication)
- 21. Role of Neutrons in the coexistence of MR and AMR bands in 107Cd**
D. Choudhury, ..A.K. Jain... et al,
Phys. Rev. C (accepted for publication)
- 22. Crossing of Large Multiquasiparticle Magnetic Rotation Bands in 198Bi**
H. Pai, G. Mukherjee, ..., A.K. Jain
Phys. Rev. C (2014) accepted for publication

- 23. Systematic of signature inversion in $(h11/2)pX(i13/2)n$ for odd-odd nuclei in rare earths**
K. Kalra, A. Goel, S. Singh, S. Kumar and A.K. Jain
Pramana J. of Phys. (2014) accepted
- 24. Experimental Study on Isotope Fractionation of Evaporating Water of Different Initial Isotopic Composition**
Pooja Devi, **A.K. Jain**, M.S. Rao and B. Kumar
Journal of Radioanalytical Nuclear Chemistry (2014) accepted, DOI: 10.1007/s10967-014-3368-7
- 25. High Spin Band Structure of ^{85}Sr**
S. Kumar, N. Kumar, S. Mandal, S.C. Pancholi, P.C. Srivastava, A.K. Jain, et al.
Phys. Rev. C (2014) C90 (2014) 024315
- 26. Conservation of Isospin in neutron rich fission fragments**
A.K. Jain, D. Choudhury and B. Maheshwari
Nucl. Data Sheets 120C (2014) 123-125
- 27. Nonadiabatic quasiparticle approach for deformed odd-odd nuclei and the proton emitter ^{130}Eu**
Monika Patial, P. Arumugam, A. K. Jain, E. Maglione, L.S. Ferreira
Phys. Rev. C88, 054302- Published 4 November 2013, **Editor's Choice**
- 28. Multiple antimagnetic rotation bands in odd-A ^{107}Cd**
Deepika Choudhury, A. K. Jain, G. Anil Kumar, Suresh Kumar et al,
Phys. Rev. C **87**, 034304 – Published 6 March 2013
- 29. Empirical evidence for magic numbers of superdeformed shapes**
Neha Sharma, H. M. Mittal, Suresh Kumar, and A. K. Jain
Phys. Rev. C **87**, 024322 – Published 27 February 2013
- 30. Effects of Coriolis and residual neutron-proton interactions in the proton emission from ^{130}Eu**
Monika Patial, P. Arumugam, A. K. Jain, E. Maglione, L.S. Ferreira
Phys. Lett., B718, 979, (2013).
- 31. Shape Evolution in Odd-A ^{137}Pm**
A. Dhal, R.K. Sinha, ...A.K. Jain, et al,
Eur. Phys. J. A48:28 (2012)
- 32. Small quadrupole deformation for the dipole bands in ^{112}In**
T. Trivedi, R. Palit, J. Sethi, S. Saha, S. Kumar, Z. Naik, A. K. Jain, D. Choudhury, et al.
Phys. Rev. C 85, 014327 (2012)
- 33. Structure of Dipole Bands in ^{112}In : Through Lifetime Measurement,**
T. Trivedi, R. Palit,, A. K. Jain, D. Choudhury, D. Negi, et al.
Journal of Physics: Conference Series 381 (2012) 012061.
- 34. The triaxial particle plus rotor model and wobbling mode: a semiclassical view**
R. Gupta, S.S. Malik, A.K. Jain and Sudhir R. Jain
AIP Conf. Proc. 1304, pp. 359-363 (2010).
- 35. Evidence of antimagnetic rotation in odd-A ^{105}Cd**
D. Choudhury, A.K. Jain et al.
Phys. Rev. C82, 2010, 061308 (Rapid Communication).

- 36. Band Structure of ^{85}Sr**
S. Kumar, S. K. Mandal, A. K. Jain, L. Chaturvedi, et al.
Proc. Exotic Nuclei and Nuclear Particle Astrophysics III: From Nuclei to Stars, Sinaia, Romania, 20 June-3 July, 2010, L.Trache, A.Smirnov, S.Stoica, Eds.; AIP Conf.Proc. 1304, 374-378 (2010).
- 37. Band Structure and Shape Coexistence in ^{135}Ba**
Suresh Kumar, A.K. Jain, et al.
Phys. Rev. C81, 2010, 067304.
- 38. Magnetic rotation - past, present and future**
A.K. Jain and Deepika Choudhury
Pramana 75, 2010, 51.
- 39. Lifetime measurement of high spin states in ^{75}Kr**
T. Trivedi, R. Palit, D. Negi, ..., A.K. Jain et al.
Nucl. Phys. A834, 2010, 72c
- 40. Shape evolution of the highly deformed ^{75}Kr nucleus examined with the Doppler-shift attenuation method**
T. Trivedi, R. Palit, D. Negi, ..., A.K. Jain, et al.
Phys. Rev. C80, 2009, 047302.
- 41. High Spin States in ^{139}Pm**
A. Dhal, R. Sinha, L. Chaturvedi, P. Agarwal, S. Kumar, A.K. Jain et al.
Phys. Rev. C80, 2009, 014320.
- 42. High Spin Features of 3QP Bands**
A.K. Jain, S. Singh, and S. Kumar
AIP Proceedings 961, 2007, 285
- 43. Bandcrossing of Magnetic Rotation Bands in ^{137}Pr**
Priyanka Agarwal, Suresh Kumar, Sukhjeet Singh,, A.K. Jain
Phys. Rev. C76, 2007, 024321.
- 44. High Spin Structure of ^{139}Nd**
Suresh Kumar, R. Palit, H.C. Jain, I. Mazumdar, P.K. Joshi, S. Roy, A.Y. Deo, Z. Naik, S.S. Malik, and A.K. Jain
Phys. Rev. C76, 2007, 014306
- 45. Signature splitting in three-quasiparticle rotational bands**
Sukhjeet Singh, S.S. Malik, and A.K. Jain
Phys. Rev. C75, 2007, 067301
- 46. Three Quasi-particle plus Rotor Model for 3QP Bands**
Sukhjeet Singh, Suresh Kumar, S.S. Malik and A.K. Jain
Physica Scripta T125, 2006, 186-187.
- 47. Loss of Collectivity in ^{79}Rb**
A.K. Jain in R.K. Sinha et al.
European Physical Journal A 28, 2006, 277-281.
- 48. Shape Changes at High Spin in ^{78}Kr**
A.K. Jain in A.Dhal et al.
European Physical Journal A 27, 2006, 33-36.
- 49. Nuclear Structure Theory: Module III**
A.K. Jain and P. Arumugam
In "*Mean Field Description of Nuclei*", Editor: Y.K. Gambhir (Narosa) 2006, 115-150.

- 50. Fusion near the Coulomb barrier for the synthesis of Heavy and Superheavy Elements**
N. Bhatia, S.S. Malik and A.K. Jain
European Physical Journal A26, 2005, 241-251.
- 51. High Spin Structure of ^{136}Ce**
S. Lakshmi, H.C. Jain, P.K. Joshi, I. Mazumdar, R. Palit, A.K. Jain, S.S. Malik
Nuclear Physics A761, 2005, 1-21.
- 52. Magnetic Rotation based on Oblate Shape in Odd Kr-Isotopes**
S.S.Malik, P.Agarwal, and A.K.Jain
Nuclear Physics A 732, 2004, 13.
- 53. Magnetic Rotation and Shape Mixing in ^{134}Ce**
S.Lakshmi, H.C.Jain, P.K.Joshi, A.K.Jain, and S.S.Malik
Physical Review C69, 2004, 014319.
- 54. The Shell Model**
A.K. Jain, S.S. Malik, and Rita Sinha
in **Radioactive Ion Beams and Physics of Nuclei Away from the Line of Stability**, Editors: I.M. Govil and R.K. Puri, (Elite Publishing), 2003, 86-98.
- 55. Geometrical Symmetries in Nuclei**
Ashok Kumar Jain
Invited lectures at the **Workshop on Nuclear Structure and Decay Data: Theory and Evaluations** held at International Centre for Theoretical Physics, Italy, 17-28 November 2003 (I.A.E.A. publications).
- 56. Eigenvalue Spectrum for Single Particle in a Spheroidal Cavity: A Semiclassical Approach**
S.S. Malik, A.K. Jain, and S.R. Jain
Int. J. Modern Physics E 11, 2002, 1-17.
- 57. Shape Transition and Tilted Axis Rotation in ^{136}Ce**
S. Lakshmi, H.C. Jain, P.K. Joshi, Amita, Priyanka Agarwal, A.K. Jain and S.S. Malik
Physical Review C66, 2002, 041303 (**Rapid Communication**)
- 58. Magnetic Rotation and Chiral Symmetry Breaking**
A.K. Jain and Amita
Pramana- Journal of Physics 57, 2001, 611-622.
- 59. Magnetic Dipole Rotational Bands in Odd-A Rb Isotopes**
Amita, A.K. Jain, V.I. Dimitrov and S.G. Frauendoff
Physical Review C 64, 2001, 034308.
- 60. Semiclassical Quantization of the Particle-Rotor Model and Salient Features of Superdeformed Bands**
S.S. Malik, A.K. Jain et al.
Int. J. Mod. Physics E9, 2000, 487-506.
- 61. Signature Splitting in Magnetic Rotational Bands**
Amita Rastogi, A.K. Jain and B. Singh
Pramana – J. Phys. 53 (1999) 463.
- 62. Trace formula for level density in a spherical billiard**
S.S. Malik, M. Dudeja and A.K. Jain
Pramana – J. Phys. 53 (1999) 243.

- 63. Shell Structure, Deformation and Rotational Phenomena in Nuclei**
A.K. Jain
In **Nuclear Structure**, Editor: L. Satpathy,
(Narosa Publishing) 1998, 71-107.
- 64. An Empirical Analysis of Superdeformed Bands: A Semiclassical View**
Manisha Dudeja, Sham S. Malik and Ashok K. Jain
Physics Letters B412, 1997, 14-18.
- 65. Non-linear Dynamics of Particles Rotor Model and Superdeformed Bands**
Ashok K. Jain, Manisha Dudeja, Zafar Ahmed and Sham S. Malik
Physics Letters B392, 1997, 243-248.
- 66. Systematics of Signature Inversion in Doubly-Odd Nuclei and the Role of $\frac{1}{2}[541]$ Proton Orbital**
Alpana Goel and Ashok K. Jain
Nuclear Physics A620, 1997, 265-276.
- 67. Signature Inversion in the $K=4$ Band in Doubly-Odd ^{152}Eu and ^{156}Tb Nuclei: Role of the $h_{9/2}$ Proton Orbital**
Alpana Goel and Ashok K. Jain
Pramana- J. of Physics 46, 1996, 51-66.
- 68. Nonlinear Dynamics of High-j Cranking Model: A Semiclassical Approach**
Sudhir R. Jain, Ashok K. Jain and Zafar Ahmed
Physics Letters B370, 1996, 1-4.
- 69. Some New Universal Features of the Mass-190 Superdeformed Bands**
Ashok K. Jain and Manisha Dudeja
J. Korean Physics Soc. 29, 1996, S361-365.
- 70. Superdeformation-Present Status and Some New Universal Features**
Ashok K. Jain and Sudhir R. Jain
Proceedings of the Second National Workshop on Nuclear Structure Physics, Roorkee, Feb. 7-10, 1995 (Ed. S.N. Chintalpudi and A.K. Jain), 1995, pp, 57-72.
- 71. Cranking Model-Nonlinear Phenomena at High Spin and Superdeformation**
Sudhir R. Jain and Ashok K. Jain
Proceedings of the Second National Workshop on Nuclear Structure Physics, Roorkee, Feb, 7-10, 1995 (Ed. S.N. Chintalpudi and Ashok K. Jain), 1995, pp, 241-254.
- 72. Nuclear Models for High Spin Physics: A Critique**
Ashok Kumar Jain
Nuclear Physics (India) 37B, 1995, pp, 199-218.
- 73. Rotational Band Structure and Transition Moments from Particle plus Rotor Model**
Ashok Kumar Jain
Proceedings of the National Workshop on Directions in Nuclear Structure Research at High Angular Momentum, Bombay University, 1994, Ed. S.B. Patel, pp, 98-101.
- 74. Signature Reversal in 2-QP $K=3$ and 4 bands in ^{170}Yb**
Alpana Goel and A.K. Jain
Physics Letters B337, 1994, 240-244.
- 75. Level Structure in the Odd-Odd Nucleus 180-Re**
A.K. Jain, P.C. Sood and R.K. Sheline
Pramana-J. of Physics 43, 1994, 339-352.

- 76. Signature Effects in 2-QP Rotational Bands**
A.K. Jain and Alpana Goel
in “**Spectroscopy and Structure of Molecules and Nuclei**”, Eds. N.R. Johnson and M. El Sayed
(World Scientific, Singapore, 1993), pp. 337-342.
- 77. The VMI model revisited in the Odd-Odd Rare-earth Nuclei**
A.K. Jain and Alpana Goel
Int. J. Mod. Phys. E2, 1993, 923-941.
- 78. Single and Multi-quasiparticle states in Rare-earth and Actinides**
Ashok Kumar Jain
In Proceeding of National Workshop on Nuclear Structure Physics, Eds. S. N. Chintalpudi and R. Shyam (IUC for DAE Facilities, Calcutta, 1993), pp. 68-79.
- 79. Coriolis Coupling in two-Quasiparticle Rotational Bands of Deformed Even-even Nuclei**
Alpana Goel and Ashok K. Jain
Phys. Rev. C 45, 1992, 221-229.
- 80. Mechanism of Signature Inversion In Odd-odd Rotational Bands**
A.K. Jain and Alpana Goel
Physics Letters B277, 1992, 233-237.
- 81. An Empirical Model for Three-Quasiparticle states**
Kiran Jain and Ashok K. Jain
Phys. Rev. C45, 1992, 3013-3016.
- 82. Newby Shift of K=0 Bands of Deformed Odd-odd Rare-Earths**
Alpana Goel, Ashok K. Jain, R.W. Hoff and R.K. Sheline
Pramana- J. Physics, 36, 1991, 105-114.
- 83. Neutron-Proton Interaction and Bandcrossing in the Cranking Model**
J. Kvasil, A.K. Jain and R.K. Sheline
Czech. J. Phys. B40, 1990, 278-300.
- 84. Level Structure of ^{180}Lu and Nucleosynthesis of $^{180}\text{Ta}^m$**
P.C. Sood, A.K. Jain, R.W. Hoff, R.K. Sheline and D.G. Burke
In *Nuclear Structure in Nineties*, Ed. N.R. Johnson (ORNL, 1990), Vol. I, pp. 236-237.
- 85. Deformed Odd-odd Nuclei: Matrix Elements for the Residual n-p Interaction and Patterns of Alternating Perturbations in Level Spacing**
R.W. Hoff, A.K. Jain, J. Kvasil, P.C. Sood and R.K. Sheline
In *EXOTIC NUCLEAR SPECTROSCOPY*, Ed, Wm. C. McHarris (Plenum Press, 1990) Chapter 27, pp, 413-425.
- 86. Application of the VMI Model to Rotational Bands in Odd-odd Nuclei**
Alpana Goel and Ashok K. Jain
Modern Physics Letters A5, 1990, 2403-2406.
- 87. Coriolis Coupling in the Rotational Bands of Deformed Odd-odd Nuclei**
A.K. Jain, J. Kvasil, R.K. Sheline and R.W. Hoff
Physical Review C40, 1989, 432-444.
- 88. Spectroscopy of the High-Lying Configurations in ^{210}Bi**
R.K. Sheline, R.L. Ponting, A.K. Jain, J. Kvasil, B. Nianga and L. Nkwambiaya
Czech. J. Physics B39, 1989, 22-54.

- 89. Effective Decoupling in Some Odd-A Odd-Z Rotational Bands**
Kiran Jain, A.K. Jain and R.K. Sheline
Pramana- J. Physics 32, 1989, 209-229.
- 90. Variation of Interband Interaction Strength in Odd-A Nuclei**
Kiran Jain, A.K. Jain and R.K. Sheline
Pramana- J. Physics 32, 1989, 231-239.
- 91. Reflection Assymmetric and Symmetric Shapes in ^{225}Ra ; Polarisation Effect of Odd Particles**
R.K. Sheline, A.K. Jain, Kiran Jain and I. Ragnarsson
Physics Letters B219, 1989, 47-51.
- 92. Octupole Deformation in Nuclei**
Ashok K. Jain
Nuclear Physics (India) B A32, 1989, 27-46.
- 93. Observation of $\pm F_0$ Symmetry in F-Spin Multiplets**
Ashok K. Jain and R.F. Casten
Modern Physics Letters A3, 1988, 743-747.
- 94. Odd-Even Staggering in the $K=1, 2, 3$ and 4 Rotational Bands of Deformed Odd-Odd Nuclei**
A.K. Jain, J. Kvasil, R.K. Sheline and R.W. Hoff
Physics Letters B209, 1988, 19-22.
- 95. Possible Octupole Deformation in Cs and Ba Nuclei from their Differential Radii**
R.K. Sheline, A.K. Jain and Kiran Jain
Physical Review C38, 1988, 2952-2954.
- 96. Bandcrossing and Alignment in Odd-N Odd-A Bands from the Effective Decoupling Model**
Kiran Jain and A.K. Jain
Proceedings of Second Asia Pacific Physics Conference (Bangalore, India), Vol. I,
Ed. S. Chandrasekhar, 1986, pp 495-504.
- 97. Importance and Usefulness of Studying Energy Level Systematics in Collective Band Spectra**
A.K. Jain
Radiation Effects 95, 1986, 1167-1170.
- 98. Description of Multiband Structure in ^{154}Gd and ^{156}Gd on Symmetry Considerations**
P.C. Sood and A.K. Jain
Z. Physik A320, 1985, 267-270.
- 99. Some comments on the Coriolis Attenuation Problem**
A.K. Jain and Kiran Jain
Pramana- J. Phys. 25, 1985, 267-273.
- 100. Strongly Coupled Bands as 'Effectively' Decoupled Bands**
A.K. Jain
Z. Physik A317, 1984, 117-121.
- 101. Effective Decoupling From the Particle Rotor Model**
Kiran Jain and A.K. Jain
Phys. Rev. C30, 1984, 2050-2057.

102. Correlation between Gaps in Single Particle Level Scheme and the Backbending Feature for Deformed Nuclei

A.K. Jain and P.C. Sood

Journal of Physics G4, 1978, 81-89.

103. Exponential Model with Pairing Attenuation and the Backbending Phenomenon

P.C. Sood and A.K. Jain

Physical Review C18, 1978, 1906-1916.

104. Comparison of Ang. Velocity and Ang. Mom. Expansions for Yrast Band Levels

P.C. Sood and A.K. Jain

Physical Review C12, 1975, 1064-1068.