

**UMESH GARG****PROFESSOR  
OF PHYSICS****AT NOTRE DAME  
SINCE 1982****BORN:** March 29, 1953**AT:** Bikaner, India

Birla Institute of Technology & Science, Pilani, India; 1972; B.Sc.  
 Birla Institute of Technology & Science, Pilani, India; 1974; M.Sc.  
 State University of New York at Stony Brook, New York; 1975; M.A.  
 State University of New York at Stony Brook, New York; 1978; Ph.D.

Graduate Assistant, S.U.N.Y., 1974-1978.  
 Research Associate, Texas A&M University, 1978-1982.  
 Assistant Professor, University of Notre Dame, 1982-1987.  
 Associate Professor, University of Notre Dame, 1987-1994.  
 Professor, University of Notre Dame, 1994-present.  
 Fellow, American Physical Society

Consultant, Cyclotron Institute, Texas A&M Univ., August 1982 and June 1983.  
 Guest Scientist, Argonne National Laboratory, 1983-present.  
 Visiting Scientist, B.A.R.C., Bombay, India, June 1985, January 1987, and October 2003.  
 Faculty Research Participant, Argonne National Laboratory, July-August 1985.  
 Visiting Professor, Vrije Universiteit, Amsterdam, The Netherlands, August 1988 -  
 August 1989.

Government of India Merit Scholarship in Residential Schools, 1961-1968.  
 Government of India National Merit Scholarship, 1968-1974.  
 Teaching Assistantship, S.U.N.Y., Stony Brook, 1974-1975.  
 NSF Research Assistantship, S.U.N.Y., Stony Brook, 1975-1978.  
 State Education Board Gold Medal for securing 1st rank out of 80,000 candidates at the  
 Higher Secondary Examination, 1969.  
 BITS Institute Gold Medals for securing 1st ranks in the B.Sc. (Phys. Sc.) and M.Sc.  
 (Physics) programs.

Member, University Senate, S.U.N.Y., Stony Brook, 1976-1977.  
 Member, University Council, S.U.N.Y., Stony Brook, 1977.  
 Member, Faculty Senate, University of Notre Dame, 1991-1997, 2003-2004.  
 Member, Academic Affirmative Action Committee, University of Notre Dame, 1992-  
 1995.  
 Member, Graduate Council, University of Notre Dame, 1999-2002; 2006-2007.  
 Member, Executive Committee, Academic Council, University of Notre Dame, 2000-  
 2003; 2006-  
 Member, College Council, University of Notre Dame, 1999-2002.  
 Member, Faculty Athletic Board, University of Notre Dame, 2002-2005  
 Member, University Committee on Diversity, University of Notre Dame, 2005-

Member, STAR Council, 1992-1999.

Organizer, ND/Argonne BGO Workshop, Notre Dame, 1983.

Member, Organizing Committee, APS Meeting, Notre Dame, 1983.

Chairperson, Nominating Committee, NSCL Users' Group, 1984.

Co-Chairman, Organizing Committee, SNEAP XX, 1986.

Co-Editor, SNEAP XX Proceedings (World Scientific, 1987).

Member, Design Committee, GAMMASPHERE project.

Member, Organizing Committee, Wetherill Symposium on Nuclear Superdeformation, Philadelphia, 1991.

Organizer, Notre Dame Workshop on Giant Resonances and Related Phenomena, Notre Dame, 1991.

Chairman, Nominating Committee, Indian Physics Association, U.S. Chapter, 1992-1997.

Coordinator, Proposal for a RDM device for GAMMASPHERE, 1992-1996.

Member, International Advisory Committee, International Workshop on Physics with Recoil Separators and Detector Arrays, New Delhi, India, 1995.

Member, North American Ad-hoc Committee for INPC-2001, 1995.

Member, Program Committee, Division of Nuclear Physics, American Physical Society, 1995-1997.

Member, Organizing Committee, Conference on Nuclear Structure at the Limits, Argonne, IL, 1996.

Co-organizer, RIKEN Symposium and Workshop on Selected Topics in Nuclear Collective Excitations, Saitama, Japan, 1999.

Member, International Advisory Board, International Symposium on Exotic Nuclear Structures (ENS 2000), Debrecen, Hungary, 2000.

Member, International Advisory Committee, International Symposium on Nuclear Physics, Mumbai, India, 2000.

Organizer, Notre Dame Mini-Workshop on Nuclear Incompressibility, Notre Dame, 2001.

Member, International Advisory Committee, Symposium on Nuclear Physics, Mumbai, India, 2001.

Member, International Advisory Committee, Conference on Nuclear Structure and Related Topics (NSRT03), Dubna, Russia, 2003.

Organizer, JINA Workshop on Nuclear Incompressibility, Notre Dame, 2005.

Member, International Advisory Committee, NSRT06, Dubna, Russia, 2006.

Discussion Leader on the topic of Symmetry Energy and Astrophysics at the 2008 Gordon Conference on Nuclear Chemistry held at Colby-Sawyer College, New London, New Hampshire, June 15-20, 2008.

Member, International Advisory Committee for the International Conference on Nuclear Structure and Related Topics (NSRT09), Dubna, Russia, June 30 – July 4, 2009.

Referee, Physical Review C, Physical Review Letters, Physics Letters B, Nuclear Physics A, Modern Physics Letters A, Physics Reports.

Reviewer, National Science Foundation.

NSF Review Panel for Physics Division, 2002, 2003.

## **Research Activities**

Since June 1982 - Physics Department, University of Notre Dame

Current research interests are giant resonances (in particular, the isoscalar giant dipole resonance), exotic quantal rotation, superdeformation and other high angular momentum phenomena, precision lifetime measurements. Experiments are carried out at the ATLAS accelerator facility at Argonne; RCNP, Osaka, Japan; GANIL facility at Caen, France; and, the Inter University Accelerator Center, New Delhi, India.

Led the Notre Dame effort in the construction and operation of the Notre Dame/Argonne BGO Detector System for use at ATLAS. This device, consisting of a 50-element BGO "ball" surrounded by 12 Compton-suppressed Ge detectors has been exceptionally successful.

Important recent accomplishments include the discovery of the isoscalar giant dipole resonance, an exotic mode of nuclear deformation, and elucidation of its properties; experimental determination of the nuclear incompressibility; first observation of a composite pair of chiral rotational bands, and affirmation of chirality in nuclei; discovery of superdeformation in the  $A=190$  region; elucidation of multiple shapes in  $^{191}\text{Hg}$  and  $^{193}\text{Tl}$ ; and, evidence of emergence of collectivity at  $N \geq 52$ .

Led the effort in the design, fabrication, testing and installation of a state-of-art RDM device for use in conjunction with Gammasphere.

Nov. 1978 - May 1982 - Research Associate, Texas A & M University

Research work involved experimental studies of giant resonances, especially the isoscalar breathing mode state, using inelastic alpha- and heavy-ion scattering, and spectroscopic studies of nuclei using "massive transfer" reactions. An important accomplishment was the discovery of the splitting of the giant monopole resonance in deformed nuclei.

Sept. 1974 - Nov. 1978 - Graduate Assistant, S.U.N.Y. at Stony Brook

Thesis work involved experimental studies of high-spin states and band structures in the  $Z > 50$  transitional nuclei using the techniques of in-beam  $\gamma$ -ray spectroscopy following (HI, xpyn) reactions. Also studied the high-spin states in the Pb region wherein several isotopes of At, Po and Rn were investigated. An important accomplishment was the observation of band structures built on deformed  $9/2^+$  proton hole states in the light-mass Cs nuclei.

## Umesh Garg

### List of Scientific Publications (Refereed Journals)

1. “Deformed  $9/2^+$  proton-hole states in odd-A  $^{119-125}\text{Cs}$ ,” **U. Garg**, T.P. Sjoreen and D.B. Fossan, Phys. Rev. Letters 40, 831 (1978).
2. “The g-factor of the  $25/2^+$  isomeric state in  $^{207}\text{At}$ ; Evidence for neutron excitation,” T.P. Sjoreen, **U. Garg** and D.B. Fossan, Phys. Letters 76B, 397 (1978).
3. “Magnetic moment measurement of the  $^{129}\text{Cs}$   $11/2^-$  isomer in a CsI cubic environment,” M.S. Dewey, H.-E. Mahnke, P. Chowdhury, **U. Garg**, T.P. Sjoreen and D.B. Fossan, Phys. Rev. C18, 2061 (1978).
4. “Collective properties of the odd-mass Cs nuclei I:  $^{127,129,131,133}\text{Cs}$ ,” **U. Garg**, T.P. Sjoreen and D.B. Fossan, Phys. Rev. C19, 207 (1979).
5. “Collective properties of the odd-mass Cs nuclei II:  $^{119,121,123,125}\text{Cs}$ ,” **U. Garg**, T.P. Sjoreen and D.B. Fossan, Phys. Rev. C19, 217 (1979).
6. “High-spin states in the odd-odd nucleus  $^{212}\text{At}$ ,” T.P. Sjoreen, **U. Garg**, D.B. Fossan, J.R. Beene, T.K. Alexander, E.D. Earle, O. Hausser and A.B. McDonald, Phys. Rev. C20, 960 (1979).
7. “High-spin states in  $^{210}\text{Rn}$ : The effect of the neutron holes on the four-proton configurations,” A.R. Poletti, T.P. Sjoreen, D.B. Fossan, **U. Garg**, A. Neskakis and E.K. Warburton, Phys. Rev. C20, 1768 (1979).
8. “Isoscalar breathing mode state in  $^{90}\text{Zr}$  and  $^{116}\text{Sn}$ ,” C.M. Rozsa, D.H. Youngblood, J.D. Bronson, Y.-W. Lui and **U. Garg**, Phys. Rev. C21, 1252 (1980).
9. “Spectroscopy of  $^{213}\text{At}$ ,  $^{212}\text{Po}$  and  $^{210}\text{Pb}$  following  $^{208}\text{Pb} + ^7\text{Li}$ ,” T.P. Sjoreen, **U. Garg** and D.B. Fossan, Phys. Rev. C21, 1838 (1980).
10. “Observation of giant monopole resonance in  $^{64,66}\text{Zn}$ ,” Y.-W. Lui, P. Bogucki, J.D. Bronson, **U. Garg**, C.M. Rozsa, and D.H. Youngblood, Phys. Lett. 93B, 31 (1980).
11. “Excitation of giant resonances in  $^{208}\text{Pb}$  using inelastic  $^{14}\text{N}$  scattering,” **U. Garg**, P. Bogucki, J.D. Bronson, Y.-W. Lui, K. Nagatani, E. Takada, N. Takahashi, T. Yamaya, and D.H. Youngblood, Phys. Lett. 93B, 39 (1980).
12. “Splitting of the giant monopole resonance with deformation in Sm nuclei,” **U. Garg**, P. Bogucki, J.D. Bronson, Y.-W. Lui, C.M. Rozsa, and D.H. Youngblood, Phys. Rev. Lett. 45, 1670 (1980).
13. “High-spin states in  $^{207}\text{At}$ ,” T.P. Sjoreen, **U. Garg**, and D.B. Fossan, Phys. Rev. C23, 272 (1981).

14. "Band structure in neutron-deficient <sup>117,119,121</sup>Xe nuclei," P. Chowdhury, **U. Garg**, T.P. Sjoreen, and D.B. Fossan, Phys. Rev. C23, 733 (1981).
15. "Systematics of the giant monopole resonance from inelastic alpha scattering," D.H. Youngblood, P. Bogucki, J.D. Bronson, **U. Garg**, Y.-W. Lui, and C.M. Rozsa, Phys. Rev. C23, 1997 (1981).
16. "Giant resonances in <sup>40</sup>Ca," Y.-W. Lui, J.D. Bronson, C.M. Rozsa, D.H. Youngblood, P. Bogucki, and **U. Garg**, Phys. Rev. C24, 884 (1981).
17. "High spin states in <sup>205</sup>At," T.P. Sjoreen, D.B. Fossan, **U. Garg**, A. Neskakis, A.R. Poletti, and E.K. Warburton, Phys. Rev. C25, 889 (1982).
18. "In-beam spectroscopy of neutron-rich nuclei: A new application of massive-transfer reactions," D.R. Haenni, T.T. Sugihara, R.P. Schmitt, G. Mouchaty, and **U. Garg**, Phys. Rev. C25, 1699 (1982).
19. "Comment on the Evidence for a Giant Monopole Resonance in <sup>58</sup>Ni," **U. Garg**, D.H. Youngblood, P. Bogucki, J.D. Bronson, Y.-W. Lui, and C.M. Rozsa, Phys. Rev. C25, 3204 (1982).
20. "Giant Monopole Resonance in Transitional and Deformed Nuclei," **U. Garg**, P. Bogucki, J.D. Bronson, Y.-W. Lui, and D.H. Youngblood, Phys. Rev. C29, 93 (1984).
21. "Angular Momentum Alignment in the Reaction <sup>154</sup>Sm + 214MeV <sup>32</sup>S," G. Mouchaty, D.R. Haenni, S. Nath, **U. Garg**, and R.P. Schmitt, Z. Phys. A316, 285 (1984).
22. "Giant Resonances in <sup>112</sup>Sn," Y.-W. Lui, P. Bogucki, J.D. Bronson, D.H. Youngblood, and **U. Garg**, Phys. Rev. C30, 51 (1984).
23. "Giant Resonances in <sup>90</sup>Zr Excited with 35 MeV/nucleon <sup>14</sup>N Ions," **U. Garg**, **W.A. Hollerman**, A. Galsonky, W.G. Lynch, M.B. Tsang, J. van der Plicht, Y.W. Lui, and D.H. Youngblood, J. Phys. Soc. Jpn. 54, Suppl. II, 505 (1985).
24. "Backbending in the 1/2-[541] Band in <sup>181</sup>Ir," **U. Garg**, **E.R. Marshalek**, **A. Chaudhury**, **E.G. Funk**, **R. Kaczarowski**, **J.W. Mihelich**, D. Frekers, R.V.F. Janssens, and D. Radford, Phys. Lett. 151B, 335 (1985).
25. "Collective Structures in the Odd-Z Transitional Nuclei <sup>115,117</sup>I and <sup>121,123</sup>Sb," W.F. Piel, Jr., P. Chowdhury, **U. Garg**, M.A. Quader, P.M. Stwertka, S. Vajda, and D.B. Fossan, Phys. Rev. C31, 456 (1985).
26. "Giant Quadrupole and Monopole Resonances in <sup>28</sup>Si," Y.-W. Lui, J.D. Bronson, D.H. Youngblood, Y. Toba, and **U. Garg**, Phys. Rev. C31, 1643 (1985).

27. "Total  $\gamma$ -ray Spectrum in  $^{153}\text{Ho}$ : From the Yrast line into the Continuum," D. Radford, I. Ahmad, R. Holzmann, R.V.F. Janssens, T.L. Khoo, **M.W. Drigert**, **U. Garg**, and H. Helppi, Phys. Rev. Lett. 55, 1727 (1985).
28. "Nuclear Structure in  $^{95,97}\text{Ru}$  Nuclei," P. Chowdhury, B.A. Brown, **U. Garg**, R.D. McKeown, T.P. Sjoreen, and D.B. Fossan, Phys. Rev. C32, 1238 (1985).
29. "Gamma-ray Multiplicity Distribution Associated with Massive Transfer," T. Inamura, A.C. Kahler, D.R. Zolnowski, **U. Garg**, T.T. Sugihara, and M. Wakai, Phys. Rev. C32, 1539 (1985).
30. "Intruder States in Highly Neutron Deficient Pt Nuclei: Evidence from Lifetime Measurements?," **U. Garg**, **M.W. Drigert**, **A. Chaudhury**, **E.G. Funk**, **J.W. Mihelich**, D.C. Radford, H. Helppi, R. Holzmann, R.V.F. Janssens, T.L. Khoo, A.M. Van den Berg, and J.L. Wood, in Nuclei Off the Line of Stability, edited by R.A. Meyer and D.S. Brenner, 1986 (ACS Symposium Series 324, American Chemical Society, Washington, DC), p. 239.
31. "Band Structure Change in  $Z > 50$  Region: Doubly Odd  $^{120,122}\text{Cs}$  and  $^{126,128}\text{La}$ ," M.A. Quader, C.W. Beausang, P. Chowdhury, **U. Garg**, W.F. Piel, Jr., and D.B. Fossan, Phys. Rev. C33, 1109 (1986).
32. "Direct Contributions to the Decay of Isoscalar Giant Resonances in  $^{58}\text{Ni}$ ," P. Grabmayr, G.J. Wagner, K.T. Knopfle, H. Riedesel, P. Bogucki, J.D. Bronson, Y.W. Lui, **U. Garg**, and D.H. Youngblood, Phys. Rev. C34, 322 (1986).
33. "The Correlation of Linear Momentum and Angular Momentum Transfer in the Reactions of 310 MeV  $^{16}\text{O}$  with  $^{154}\text{Sm}$ ," M.N. Namboodiri, R.K. Choudhury, L. Adler, J.D. Bronson, D. Fabris, **U. Garg**, P. Gonthier, K. Hagel, D. R. Haenni, Y.-W. Lui, Z. Majka, G. Mouchaty, T. Murakami, J.B. Natowitz, G. Nebbia, R.D. Schmitt, S. Simon, J.P. Sullivan, and D.H. Youngblood, J. de Physique, Colloque C4, 47, 101 (1986).
34. "Lifetime Measurements in  $^{184}\text{Pt}$  and the Shape Co-existence Picture," **U. Garg**, **A. Chaudhury**, **M.W. Drigert**, **E.G. Funk**, **J.W. Mihelich**, D.C. Radford, H. Helppi, R. Holzmann, R.V.F. Janssens, T.L. Khoo, A.M. Van den Berg, and J.L. Wood, Phys. Lett. 180B, 319 (1986).
35. "Linear Momentum and Angular Momentum Transfer in the Reactions of  $^{16}\text{O}$  with  $^{154}\text{Sm}$ ," M.N. Namboodiri, R.K. Choudhury, L. Adler, J.D. Bronson, D. Fabris, **U. Garg**, P.L. Gonthier, K. Hagel, D.R. Haenni, Y.W. Lui, Z. Majka, G. Mouchaty, T. Murakami, J.B. Natowitz, G. Nebbia, R.P. Schmitt, S. Simon, J.P. Sullivan, and D.H. Youngblood, Phys. Rev. C37, 149 (1987).
36. "Level Structure of  $^{148}\text{Gd}$  Up to  $I = 44$ ," M. Piiparinen, **M.W. Drigert**, R.V.F. Janssens, I. Ahmad, J. Borggreen, R.R. Chasman, P.J. Daly, B.K. Dichter, H. Emling, **U. Garg**, Z.W. Grabowski, R. Holzmann, T.L. Khoo, W.C. Ma, M. Quader, D.C. Radford, and W. Trzaska, Phys. Lett. B 194, 468 (1987).

37. “Evolution of Nuclear Structure with Increasing Spin and Internal Excitation Energy in  $^{152}\text{Dy}$ ,” R. Holzmann, I. Ahmad, B.K. Dichter, H. Emling, R.V.F. Janssens, T.L. Khoo, W.C. Ma, **M.W. Drigert**, **U. Garg**, D.C. Radford, P.J. Daly, Z. Grabowski, H. Helppi, M. Quader, and W. Trzaska, Phys. Lett. B195, 321 (1987).
38. “A New Method for Measuring the Neutron-Induced Background in BGO Compton-Suppressed Ge Detectors Applied to In-Beam  $\gamma$ -Ray Studies,” R. Holzmann, I. Ahmad, R.V.F. Janssens, T.L. Khoo, D.C. Radford, **M.W. Drigert**, and **U. Garg**, Nucl. Inst. Methods A260, 153 (1987).
39. “Evidence for Superdeformation in  $^{148}\text{Gd}$ ,” **M.W. Drigert**, R.V.F. Janssens, R. Holzmann, R.R. Chasman, I. Ahmad, J. Borggreen, P.J. Daly, B.K. Dichter, H. Emling, **U. Garg**, Z.W. Grabowski, T.L. Khoo, W.C. Ma, M. Piiparinen, M. Quader, D.C. Radford, and W. Trzaska, Phys. Lett. B201, 223 (1988).
40. “Electromagnetic Transitions in Neutron-Rich  $^{40}\text{Cl}$ ,” R.L. Kozub, J.F. Shriner, Jr., M.M. Hindi, R. Holzmann, R.V.F. Janssens, T.L. Khoo, W.C. Ma, **M. Drigert**, **U. Garg**, and J.J. Kolata, Phys. Rev. C, 37, 1791 (1988).
41. “Giant Resonance Studies Using Inelastic Scattering of Heavy Ions,” **U. Garg**, Notas de Fisica, Mexico, 11, 87 (1988).
42. “Structural Changes Along and Above the Yrast Line of  $^{154}\text{Dy}$ ,” W.C. Ma, M.A. Quader, I. Ahmad, P.J. Daly, B.K. Dichter, **M. Drigert**, H. Emling, **U. Garg**, Z.W. Grabowski, R. Holzmann, R.V.F. Janssens, T.L. Khoo, M. Piiparinen, W.H. Trzaska, and T.-F. Wang, Phys. Rev. Lett. 61, 46 (1988).
43. “A Superdeformed Band in  $^{151}\text{Dy}$ ,” G.E. Rathke, R.V.F. Janssens, **M.W. Drigert**, I. Ahmad, **K. Beard**, R.R. Chasman, **U. Garg**, M. Hass, T.L. Khoo, H.J. Körner, W.C. Ma, S. Pilotte, P. Taras, and R.L.H. Wolfs, Phys. Lett. B 29, 177 (1988).
44. “When Nuclei Really Get Dizzy: Investigations at High Angular Momentum with the Argonne/Notre Dame Gamma Ray Facility,” **U. Garg** in Proc. Symp. on Nuclear Physics, D.M. Nadkarni, editor (Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India) 31A, 249 (1988).
45. “Structure in the E2 Quasicontinuum Spectrum of  $^{154}\text{Dy}$ ,” R. Holzmann, T.L. Khoo, W.C. Ma, I. Ahmad, B.K. Dichter, H. Emling, R.V.F. Janssens, **M.W. Drigert**, **U. Garg**, M.A. Quader, P.J. Daly, M. Piiparinen, and W. Trzaska, Phys. Rev. Lett. 62, 520 (1989).
46. “Lifetime Measurements of Terminating and Collective High-Spin Configurations in  $^{155}\text{Dy}$  and  $^{156}\text{Dy}$ ,” H. Emling, I. Ahmad, P.J. Daly, B. Dichter, **M. Drigert**, **U. Garg**, Z. Grabowski, R. Holzmann, R.V.F. Janssens, T.L. Khoo, W.C. Ma, M. Piiparinen, I. Ragnarsson, W.H. Trzaska and M.A. Quader, Phys. Lett. B 217, 33 (1989).
47. “The g-factor of the  $59/2$ , 1ns level in  $^{147}\text{Gd}$ ,” M. Hass, I. Ahmad, R.V.F. Janssens, T.L. Khoo, H.J. Körner, E.F. Moore, F.L.H. Wolfs, N. Benczer-Koller, E. Dafni, **K. Beard**, **U. Garg**, P.J. Daly, and M. Piiparinen, Phys. Rev. C 39, 2237 (1989).

48. "Observation of Superdeformation in  $^{191}\text{Hg}$ ," E.F. Moore, R.V.F. Janssens, R.R. Chasman, I. Ahmad, T.L. Khoo, F.L.H. Wolfs, **D. Ye, K.B. Beard, U. Garg**, M.W. Drigert, Ph. Benet, Z.W. Grabowski, and J.A. Cizewski, Phys. Rev. Lett. 63, 360 (1989).
49. "Interplay between single-particle and collective degrees of freedom in the excitation of the low-lying quadrupole states in  $^{142}\text{Nd}$ ," R.K.J. Sandor, H.P. Blok, **U. Garg**, M.N. Harakeh, C.W. de Jager, V. Yu. Ponomarev, A.I. Vdovin, and H. de Vries, Phys. Lett. B233, 54 (1989).
50. "A Superdeformed Band in  $^{192}\text{Hg}$ ," **D. Ye**, R.V.F. Janssens, M.P. Carpenter, E.F. Moore, R.R. Chasman, I. Ahmad, **K.B. Beard**, Ph. Benet, M.W. Drigert, P.B. Fernandez, **U. Garg**, T.L. Khoo, S.L. Ridley, and F.L.H. Wolfs, Phys. Rev. C (Rapid Communications) 41, R13 (1990).
51. "Nucleon Alignment in  $^{191}\text{Hg}$ : A Competing Mechanism at Moderate Spins," **D. Ye**, R.V.F. Janssens, M.P. Carpenter, E.F. Moore, I. Ahmad, **K.B. Beard**, Ph. Benet, M.W. Drigert, **U. Garg**, Z.W. Grabowski, T.L. Khoo, F.L.H. Wolfs, T. Bengtsson, and I. Ragnarsson, Phys. Lett. B236, 7 (1990).
52. "Charged particle Decay from Giant Monopole Resonance in  $^{28}\text{Si}$ ," Y. Toba, Y.-W. Lui, D.H. Youngblood, **U. Garg**, P. Grabmayr, K.T. Knöpfle, H. Riedesel, and G.J. Wagner, Phys. Rev. C41, 1417 (1990).
53. "Experimental Test of a Newly Proposed Empirical Relationship Between the Centroid and Width of the Giant Quadrupole Resonance and the Neutron Binding Energy of the Nucleus," **U. Garg, K.B. Beard, D. Ye**, A. Galonsky, T. Murakami, J.S. Winfield, Y.-W. Lui, and D.H. Youngblood, Phys. Rev. C41, 1845 (1990).
54. "Excited Superdeformed Bands in  $^{191}\text{Hg}$ ," M.P. Carpenter, R.V.F. Janssens, E.F. Moore, I. Ahmad, P.B. Fernandez, T.L. Khoo, F.L.H. Wolfs, **D. Ye, K.B. Beard, U. Garg**, M.W. Drigert, Ph. Benet, R. Wyss, W. Satula, W. Nazarewicz, and M.A. Riley, Phys. Lett. B240, 44-49 (1990).
55. "Lifetimes of High Spin States in  $^{181}\text{Ir}$  and  $^{180}\text{Os}$ ," **R. Kaczarowski, U. Garg, A. Chaudhary, E.G. Funk, J.W. Mihelich**, D. Frekers, R.V.F. Janssens, and T.L. Khoo, Phys. Rev. C41, 2069 (1990).
56. "Lifetime Measurements in the Superdeformed Band of  $^{192}\text{Hg}$ ," E.F. Moore, R.V.F. Janssens, I. Ahmad, M.P. Carpenter, P.B. Fernandez, T.L. Khoo, S.L. Ridley, F.L.H. Wolfs, **D. Ye, K.B. Beard, U. Garg**, M.W. Drigert, Ph. Benet, R. Wyss, and W. Nazarewicz, Phys. Rev. Lett. 64, 3127 (1990).
57. "Discrete and Continuum Gamma-ray Studies of  $^{147}\text{Gd}$  and  $^{148}\text{Gd}$ ," **M.W. Drigert**, M. Piiparinen, R.V.F. Janssens, R. Holzmann, I. Ahmad, J. Borggreen, R.R. Chasman, P.J. Daly, B.K. Dichter, M. Emling, **U. Garg**, Z.W. Grabowski, T.L. Khoo, W.C. Ma, M. Quader, D.C. Radford and W. Trzaska, Nucl. Phys. A515, 466 (1990).

58. "Proton Excitations in the Superdeformed Well of  $^{193}\text{Tl}$ ," P.B. Fernandez, M.P. Carpenter, R.V.F. Janssens, I. Ahmad, E.F. Moore, T.L. Khoo, F. Scarlassara, I.G. Bearden, Ph. Benet, P.J. Daly, M.W. Drigert, **U. Garg**, **W. Reviol**, **D. Ye**, and S. Pilotte, Nucl. Phys. A517, 386 (1990).
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## **Invited Presentations**

### AT NATIONAL AND INTERNATIONAL MEETINGS AND CONFERENCES:

“Excitation of Giant Resonances in  $^{208}\text{Pb}$  Using Inelastic  $^{14}\text{N}$  Scattering,” International Conference on Nuclear Physics, Berkeley, CA., August 24-30, 1980.

“Mixing of the Giant Monopole and Giant Quadrupole Modes in the Transitional Nucleus  $^{148}\text{Sm}$ ,” International Summer School on Nuclear Structure, Dronen, Netherlands, August 16-28, 1982.

“The Proposed Notre Dame/Argonne BGO Sum-Energy/Multiplicity Spectrometer,” Workshop on BGO Multi-Detector Spectrometer Systems, Notre Dame, July 15, 1983.

“The ND/ANL BGO Sum-Energy/Multiplicity Spectrometer and Multi-Compton-Suppression Spectrometer System,” ATLAS Facilities Workshop, Argonne, IL, November 8, 1983.

“Giant Resonances in  $^{90}\text{Zr}$  Excited with 35 MeV/nucleon  $^{14}\text{N}$  Ions,” INS-RIKEN. International Symposium on Heavy-Ion Physics, Tokyo and Mt. Fuji, Japan, August 1984 [presented by D. H. Youngblood].

“Giant Resonances in  $^{90}\text{Zr}$  Using 35 MeV/A  $^{14}\text{N}$  Ions,” International Conference on Nuclear Physics, Bombay, India, December 27-31, 1984.

“Intruder States in Highly Neutron-Deficient Pt Nuclei: Evidence from Lifetime Measurements?,” 10th Meeting of the American Chemical Society, Chicago, IL, September 8-13, 1985.

“Recent Results from the Notre Dame/Argonne BGO Array,” ATLAS Users’ Group Meeting, Washington, DC, April 28, 1986.

“Lifetime Measurements in the A=180 Region,” ATLAS Open PAC Meeting and Workshop, Argonne, IL., October 3, 1986.

“The Argonne/Notre Dame Gamma-Ray Facility,” Gordon Research Conference on Nuclear Chemistry, June, 1987.

“Response Calculations for the Proposed Gamma-Ray Facility,” Workshop on a National Gamma-Ray Facility, Oak Ridge, TN, November 19, 1987.

“Giant Resonances Using Heavy Ion Inelastic Scattering,” International Symposium on Nuclear Physics, Oaxtepec, Mexico, January 4-7, 1988.

“When Nuclei Really Get Dizzy,” Symposium on Nuclear Physics, Bombay, India, December 27-31, 1988.

- “Giant Resonance Studies Using Inelastic Scattering of Medium-Energy  $^{14}\text{N}$  Ions,” Workshop on the Interface Between Nuclear Structure and Heavy-Ion Reaction Dynamics, Notre Dame, May 24-26, 1990.
- “Superdeformation in the  $A = 190$  Region,” Symposium on Nuclear Physics, Madras, India, December 1-4, 1990.
- “Multiple Shapes in  $^{191}\text{Hg}$ ,” Workshop-Symposium on Future Directions in Nuclear Physics with  $4\pi$  Detection Systems of the New Generation, Strasbourg, France, March 4-16, 1991.
- “High Multipole Excitations via Heavy-Ion Inelastic Scattering,” Workshop-Symposium on Future Directions in Nuclear Physics with  $4\pi$  Detection Systems of the New Generation, Strasbourg, France, March 4-16, 1991.
- “Exotic Shapes in Nuclei,” ATLAS Open PAC Meeting and Workshop, Argonne, IL, December 6, 1991.
- “Electromagnetic Properties of  $^{181}\text{Ir}$ : Evidence of  $\beta$ -stretching?,” International Conference on Nuclear Structure at High Angular Momentum, Ottawa, Canada, May 18-21, 1992.
- “Spectroscopy of  $^{96}\text{Ru}$  and  $^{98}\text{Ru}$ : Structures of Varied Character at  $N \geq 52$ ,” ACS Symposium on Nuclear Shapes, Washington, DC, August 23-28, 1992.
- “Spectroscopy of  $^{96-98}\text{Ru}$ : Possible Emergence of Collectivity at  $N \geq 52$ ,” INS Symposium on Rapidly Rotating Nuclei, Tokyo, Japan, October 26-30, 1992.
- “Superdeformation in the  $A=190$  Region: Recent Results from the Argonne-Notre Dame Gamma-Ray Facility,” Workshop on Nuclear Physics with Small Detector Arrays and Mass Analyzers, New Delhi, India, December 17-19, 1992.
- “Looking for the Isoscalar Giant Dipole Resonance in  $^{208}\text{Pb}$  Inelastic  $\alpha$  Scattering at and near  $0^\circ$ ,” Gull Lake Nuclear Physics conference on Giant Resonances, Gull Lake, MI, August 17-21, 1993 [presented by B. Davis, graduate student].
- “Lifetime Measurements Using a Plunger with Gamma-Ray Arrays,” Symposium on Nuclear Structure Research with the New Arrays and Detectors, American Chemical Society, Chicago, IL, August 23-26, 1993.
- “Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” International Conference on Selected Topics in Nuclear Structure, Dubna, Russia, July 5-9, 1994.
- “Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” Symposium on Nuclear Structure and Reaction Dynamics - The Interface, Washington, DC, August 21-22, 1994.
- “Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” International Workshop on Physics with Recoil Separators and Detector Arrays, New Delhi, India, January 30-February 2, 1995.

“Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” Groningen Giant Resonance Conference, Groningen, The Netherlands, June 28-July 1, 1995.

“Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” International Conference on Nuclear Physics (INPC95), Beijing, China, August 21-26, 1995.

“Shell Model at Gammasphere: Studies in the  $A = 95$  Region,” Workshop on Gammasphere Physics, Berkeley, California, December 1-2, 1995.

“Lifetime Measurements and Shape Coexistence: From Small Arrays to Gammasphere,” International Nuclear Physics Symposium (INPS-95), Bombay, India, December 18-22, 1995.

“Isoscalar Giant Dipole Resonance in  $^{208}\text{Pb}$  from Inelastic Alpha Scattering,” ECT\* Workshop on Giant Resonances, Trento, Italy, December 9-20, 1996.

“Description of Superdeformed Bands in Terms of Incremental Alignment: A New Empirical Tool in Superdeformation Studies,” International Conference on Nuclear Structure and Related Topics, Dubna, Russia, September 9-13, 1997.

“The ‘Other’ Giant Dipole Resonance: Investigations of the Squeezing Mode,” Fall Meeting, Division of Nuclear Physics, American Physical Society, Whistler, B.C., Canada, October 5-8, 1997.

“The Isoscalar Giant Dipole Resonance, the Nuclear Incompressibility and Effective Interactions,” International Symposium on New Facet of Spin Giant Resonances in Nuclei, Tokyo, Japan, November 17-20, 1997.

“Incremental Alignment: A New Tool in Superdeformation Studies,” Symposium on Nuclear Physics, Bangalore, India, December 26-30, 1997.

“The Isoscalar Giant Dipole Resonance: A Review,” Invited Talk at Topical Conference on Giant Resonances, Varenna, Italy, May 11-16, 1998.

“Additivity of Incremental Alignment in the  $A \sim 150$  Superdeformed Region,” Invited Talk at the 6<sup>th</sup> International Spring Seminar on Nuclear Physics: Highlights of Modern Nuclear Structure, S. Agata sui due Golfi, Italy, May 18-22, 1998.

“The Isoscalar Giant Dipole Resonance: What’s New?” Invited Talk at the International Workshop on Collective Excitations in Fermi and Bose Systems, Serra Negra, Sao Paulo, Brazil, September 14-17, 1998.

“The Isoscalar Giant Dipole Resonance: Where We Stand?” RIKEN Symposium and Workshop on Selected Topics in Nuclear Collective Excitations, Saitama, Japan, March 20-24, 1999.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” National Seminar on Nuclear Physics, Bhubaneswar, India, July 26-29, 1999.

“Isoscalar Giant Dipole Resonances and the Compressibility of Nuclear Matter”, XXVI Mazurian Lakes School of Physics, Krzyze, Poland, September 1-11, 1999.

“Nuclear Incompressibility and the Isoscalar Giant Dipole Resonance,” International Symposium on Exotic Nuclear Structures, Debrecen, Hungary, May 15-20, 2000.

“The ISGDR: Most recent Results,” and “Concluding Remarks,” Notre Dame Mini-Workshop on Nuclear Incompressibility, Notre Dame, Indiana, January 30-31, 2001.

“Isoscalar Giant Dipole Resonance in  $^{208}\text{Pb}$  and Nuclear Incompressibility,” International Conference on Nuclear Physics (INPC2001), Berkeley, California, July 30-August 3, 2001.

“The ISGDR: Open Questions,” Mini-Workshop on Isoscalar Giant Dipole Resonance, University of Milan, Milan, Italy, March 16, 2002.

“Compressional-mode Giant Resonances from 400 MeV Alpha Scattering,” ECT\* Workshop on Nuclear Collective Motion at Extreme Conditions, Trento, Italy, March 18-28, 2002.

“Lifetime Measurements Using Large Arrays,” a series of three lectures at the School-cum-Workshop on Computations in Investigations of High Spin States, Calcutta, India, September 28-October 2, 2002.

“The Isoscalar Giant Dipole Resonance: A Status Report,” International Conference on Collective Motion in Nuclei under Extreme Conditions (COMEX1), Paris, France, June 10-13, 2003.

“Current world status of experimental research on the isoscalar giant dipole resonance,” ECT\* Workshop on Nuclear Response Under Extreme Conditions, Trento, Italy, October 20-24, 2003.

“Squeezing the Nucleus High Above Ripples and Tides,” Fall Meeting of the Division of Nuclear Physics, American Physical Society, Tucson, AZ, October 29-November 1, 2003.

“Nuclear Incompressibility from the Isoscalar Giant Dipole Resonance,” ACS Symposium on Nuclear Equation of State used in Astrophysics Models, Philadelphia, August 25-26, 2004.

“How Far Can You Squeeze a Star? Experimental Determination of Nuclear Incompressibility,” Invited Talk at the 2005 Joint Annual Conference of the National Society of Black Physicists and the National Society of Hispanic Physicists, Orlando, Florida, February 16-19, 2005.

“Triaxial Superdeformed Bands in  $^{163}\text{Tm}$ ,” RIKEN RIBF International Workshop on Collective Motions in Unstable Nuclei – Experiments vs. Theories, Saitama, Japan, May 24-26, 2005.

“Triaxial Superdeformed Bands in  $^{163}\text{Tm}$ ,” Invited Talk at the Indo-US Workshop on Physics with Energetic Heavy Ions and Rare Isotopes: Towards a Common Ground Between US and Indian Scientists, Chandigarh, India, October 16-19, 2005.

“Giant Monopole Resonances in the Sn isotopes: Why are the Tins so fluffy?,” Invited talk at COMEX2, 2nd International Conference on Collective Motion in Nuclei under Extreme Conditions, Sankt Goar, Germany, June 20-23, 2006.

“Nuclear Incompressibility from the Compressional-mode Giant Resonances,” Invited talk at In Heaven and on Earth 2006: The Nuclear Equation of State in Astrophysics, Montreal, Canada, July 5-7, 2006.

“Compressional-mode Giant Resonances and the Symmetry-term in Nuclear Incompressibility,” APS-DNP Long Range Plan Town Meeting on Nuclear Astrophysics, Study of Nuclei, Chicago, Illinois, January 19-21, 2007.

“The Giant Monopole Resonance in the  $^{112-124}\text{Sn}$  Isotopes and the Symmetry Energy Term in Nuclear Incompressibility,” Invited talk at the International Nuclear Physics Conference (INPC2007), Tokyo, Japan, June 3-8, 2007.

“GMR and  $K_{\tau}$ ,” Invited talk at the ECT\* Workshop on Exotic Modes of Excitation From Nuclear Structure to Astrophysics, Trento, Italy, October 8-12, 2007.

“TPC Applications to Compressional-mode Giant Resonances,” Invited talk at the TPC Workshop, National Superconducting Cyclotron Laboratory, East Lansing, Michigan, December 6-7, 2007.

“Nuclear Incompressibility and Symmetry Energy—Now and with Exotic Beams,” Invited talk at TORIJIN-EFES-NSCL Joint Workshop on Future Prospects for Spectroscopy and Direct Reactions, East Lansing, Michigan, February 26-28, 2008.

“The symmetry term of nuclear incompressibility via the giant monopole resonance,” Invited talk at the Gordon Research Conference on Nuclear Chemistry, Colby-Sawyer College, New London, New Hampshire, June 15-20, 2008.

“Nuclear Incompressibility and Symmetry Energy from the Compressional Mode Giant Resonances,” Invited Talk at the 5<sup>th</sup> ANL/MSU/JINA/INT FRIB Workshop on Bulk Nuclear Properties, East Lansing, Michigan, November 19-22, 2008.

“Nuclear Incompressibility and Symmetry Energy: A Status Report,” Invited talk at the DAE Symposium on Nuclear Physics, Roorkee, India, December 22-26, 2008.

“ $K_{\infty}K_{\tau}$ , and the “Fluffy” Tins: An Update,” Invited talk at the International Conference on Nuclear Structure and Related Topics 9NSRT09), Dubna, Russia, June 30 – July 4, 2009.

## INVITED SEMINARS/COLLOQUIA:

“Collective Properties of Odd-Mass Cesium Nuclei,” Texas A&M University, March 28, 1978.

“Collective Properties of the Odd-Mass Cs Nuclei,” Schlumberger-Doll Research Center, Ridgefield, Conn., June 10, 1979.

“Investigations on the Giant Monopole Resonance via Inelastic  $\alpha$ -Scattering,” Bhabha Atomic Research Center, Trombay, India, March 11, 1980.

“Collective Properties of the  $Z > 50$  Transitional Nuclei,” Tata Institute of Fundamental Research, Bombay, India, March 12, 1980.

“Methods of In-Beam  $\gamma$ -ray Spectroscopy and Nuclear Structure Physics,” Government Postgraduate College, Ajmer, India, March 31, 1980.

“Giant Monopole Resonance Studies via Inelastic  $\alpha$ -Scattering,” Variable Energy Cyclotron Laboratory, Calcutta, India, April 8, 1980.

“Investigations on the Giant Monopole Resonance using Inelastic  $\alpha$ -Scattering,” Los Alamos Scientific Laboratory, August 7, 1980.

“The Giant Monopole Resonance: What’s New?,” Brookhaven National Laboratory, November 10, 1980.

“The Giant Monopole Resonance: What’s New?,” M.P.I., Heidelberg, West Germany, June 16, 1981.

“The Giant Monopole Resonance: What’s New?,” Univ. of Notre Dame, September 10, 1981.

“Collective Properties of the  $Z > 50$  Transitional Nuclei,” Bell Telephone Laboratories, September 14, 1981.

“Nuclear Incompressibility,” Manchester College, North Manchester, Indiana, May 1, 1985.

“The Notre Dame/Argonne BGO Detector System;,” “Physics with Large Detector Arrays;” “Giant Resonances Using Heavy-Ion Inelastic Scattering,” Bhabha Atomic Research Center, Trombay, India, June, 1985.

“The Notre Dame/Argonne BGO Detector System,” Tata Institute of Fundamental Research, Bombay, India, July 2, 1985.

“Giant Resonances Using Inelastic Scattering of Heavy Ions;” “The Notre Dame/Argonne BGO Detector System for  $\gamma$  ray Spectroscopy,” Indian Institute of Technology, Kanpur, India, July 8-9, 1985.

“The Notre Dame/Argonne BGO Detector System,” Texas A & M University, October 25, 1985.

“Concepts in the Design of a BGO Detector Array,” Nuclear Sciences Centre, New Delhi, India, December 18, 1986.

“The Notre Dame/Argonne BGO Detector System,” Panjab University, Chandigarh, India, December 23, 1986.

“Recent Results from the Notre Dame/Argonne BGO Detector Array,” Bhabha Atomic Research Centre, Bombay, India, January 15, 1987.

“Nuclear Structure Studies Near and Above the Yrast Line,” National Superconducting Cyclotron Laboratory, East Lansing, MI, July 8, 1987.

“Giant Resonance Studies Using Heavy Ions,” Chalk River Nuclear Laboratories, Chalk River, Canada, June 9, 1988.

“When Nuclei Really Get Dizzy,” Vrije Universiteit, Amsterdam, The Netherlands, November 22, 1988.

“Giant Resonance Studies Using Heavy Ion Beams,” Kernphysik Versneller Instituut, Groningen, The Netherlands, November 29, 1988.

“Nuclear Physics at Notre Dame,” Lohia College, Churu, India, January 2, 1989.

“When Nuclei Really Get Dizzy,” Universität Köln, Köln, West Germany, May 9, 1989.

“When Nuclei Really Get Dizzy,” KFA, Jülich, West Germany, May 11, 1989.

“Giant Resonance Studies With Medium-Energy Heavy Ions,” IPN, Orsay, France, June 14, 1989.

“Giant Resonances with Heavy Ions,” GANIL, Caen, France, June 15, 1989.

“When Nuclei Really Get Dizzy,” Warsaw University, Warsaw, July 6, 1989.

“Giant Resonances with Medium-Energy Heavy Ions,” Universität Tübingen, Tübingen, West Germany, July 12, 1989.

“Electromagnetic Excitations in Peripheral Heavy Ion Collisions,” GSI, Darmstadt, West Germany, July 14, 1989.

“Giant Resonance Studies Using Medium-Energy Heavy Ions,” NIKHEF-K, Amsterdam, The Netherlands, July 27, 1989.

“Discovery of Superdeformation in Nuclei,” Drexel University, Philadelphia, PA, February 13, 1990.

“Superdeformation in Nuclei,” Arts and Science Committee of the Benjamin Franklin Institute, Philadelphia, PA, February 14, 1990.

“Superdeformation in Nuclei,” University of Michigan, Ann Arbor, March 22, 1990.

“Superdeformation in the A=190 Region,” Tata Institute of Fundamental Research, Bombay, India, December 7, 1990.

“Multitude of Shapes in  $^{191}\text{Hg}$ ,” Bhabha Atomic Research Center, Bombay, India, December 14, 1990.

“Superdeformation in Nuclei,” Nuclear Science Center, New Delhi, India, December 21, 1990.

“Superdeformation in the A-190 Region: What’s New?,” Accelerator Laboratory, University of Helsinki, Finland, March 15, 1991.

“Spectroscopy in a New Region of Superdeformation,” Jyväskylä University, Finland, March 20, 1991.

“Spectroscopy in a New Region of Superdeformation,” Institut für Kernphysik der Universität zu Köln, Germany, March 22, 1991.

“ $\gamma$ -ray Spectroscopic studies with the Argonne-Notre Dame Gamma-ray Facility,” Nuclear Science Center, New Delhi, India, January 9, 1992.

“From Single-particle to Superdeformed: A Multitude of Shapes in  $^{191}\text{Hg}$ ,” Cyclotron Institute, Texas A & M University, College Station, Texas, May 5, 1992.

“From Single-Particle to Superdeformed: A Multitude of Shapes in  $^{191}\text{Hg}$  and  $^{193}\text{Tl}$ ,” State University of New York, Stony Brook, NY, August 19, 1992.

“Giant Resonance Studies with Medium-Energy Heavy Ions,” Research Center for Nuclear Physics, Osaka, Japan, October 21, 1992.

“From Single-particle to Superdeformed: A Multitude of Shapes in Hg-Tl Nuclei,” Kyoto University, Kyoto, Japan, October 22, 1992.

“Gamma-Ray Arrays” Where Do We Go from Here?,” Nuclear Science Centre, New Delhi, India, December 19, 1992.

“Lifetime Measurements Using a Plunger with Gamma-ray Detector Arrays,” Nuclear Science Centre, New Delhi, India, January 7, 1994.

“Lifetime Measurements and Shape Coexistence in Nuclei,” Panjab University, Chandigarh, India, January 18, 1994.

“Lifetime Measurements and Shape Coexistence in Nuclei,” Lawrence Livermore National Laboratory, Livermore, California, March 1, 1994.

“Lifetime Measurements and Shape Coexistence in Nuclei,” Argonne National Laboratory, Argonne, Illinois, March 28, 1994.

“Lifetime Measurements and Shape Coexistence in Nuclei,” Vanderbilt University, Nashville, Tennessee, April 1, 1994.

“Lifetime Measurements and Shape Coexistence in Nuclei,” University of Tennessee, Knoxville, TN, May 11, 1994.

“Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” Russian Research Centre-Kurchatov Institute, Moscow, Russia, July 11, 1994.

“Evidence for the Isoscalar Giant Dipole Resonance in Inelastic Alpha Scattering at and near  $0^\circ$ ,” Soltan Institute of Nuclear Studies, Swierk, Poland, July 12, 1994.

“There is More Than One Giant Dipole Resonance: Evidence for the ISOSCALAR Giant Dipole Mode,” GSI, Darmstadt, Germany, January 26, 1995.

“There is More Than One Giant Dipole Resonance: Evidence for the ISOSCALAR Giant Dipole Mode,” Institut für Kernphysik den, Universität zu Köln, Köln, Germany, January 27, 1995.

“Lifetime Measurements and the Shape Coexistence Phenomenon,” Tsinghua University, Beijing, China, August 18, 1995.

“There is more than one Giant Dipole Resonance: Evidence for the ISOSCALAR Giant Dipole Mode,” Centre de Recherches Nucléaires, Strasbourg, France, September 13, 1996.

“Incremental Alignment: A New Empirical Tool in Superdeformation Studies,” A.I. Ioffe Institute of the Russian Academy of Sciences, St. Petersburg, Russia, September 17, 1997.

“Description of Superdeformed Bands in Terms of Incremental Alignments and Predictions of New Superdeformed Bands in the  $A=150$  Region,” University of Helsinki, Helsinki, Finland, September 19, 1997.

“The Isoscalar Giant Dipole Resonance,” Institut für Kernphysik, Münster University, Münster, Germany, September 24, 1997.

“Description of Superdeformed Bands in terms of Incremental Alignments,” Nuclear Science Center, New Delhi, India, January 7, 1998.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” Inter University Consortium for DAE Facilities, Calcutta, India, January 9, 1998.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” Argonne National Laboratory, Argonne, Illinois, January 26, 1998.

“The Isoscalar Giant Dipole Resonance,” National Superconducting Cyclotron Laboratory, East Lansing, Michigan, October 21, 1998.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” Bhabha Atomic Research Centre, Bombay, India, January 8, 1999.

“Clovers, Clusters and Hybrids: Gamma Ray Spectroscopy in the Near Future,” Nuclear Science Center, New Delhi, India, February 6, 1999.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” Florida State University, Tallahassee, Florida, March 12, 1999.

“Incremental Alignments: A New Tool in the Study of Superdeformed Nuclei,” Japan Atomic Energy Research Institute, Ibaraki, Japan, March 19, 1999.

“Lifetime Measurements Using Doppler Shift Methods,” University of Tennessee, Knoxville, Tennessee, June 2, 1999.

“The Isoscalar Giant Dipole Resonance and Nuclear Incompressibility,” Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 3, 1999.

“Nuclear Incompressibility”, Inter-University Consortium for DAE Facilities, Calcutta, India, August 6, 1999.

“The Isoscalar Giant Dipole Resonance and its Role in the Nuclear Compressibility”, Saha Institute for Nuclear Physics, Calcutta, India, August 6, 1999.

“Incremental Alignments in Superdeformed Nuclei,” RIKEN, Saitama, Japan, March 24, 2000.

“Lifetime Measurements Using the RDM Technique: From Small Arrays to Gammasphere,” Japan Atomic Energy Research Institute, Tokai, Japan, March 25, 2000.

“Lifetime Measurements with Small and Large Detector Arrays,” IUCDAEF-Calcutta Centre, Calcutta, India, June 27, 2000.

“Lifetime Measurements in Exotic Nuclei with Evaporation-Residue Tagging,” Nuclear Science Centre, New Delhi, India, July 3, 2000.

“Giant Resonances and Nuclear Incompressibility,” Ball State University, Muncie, Indiana, February 7, 2002.

“Compressional-mode Giant Resonances and Nuclear Incompressibility,” RIKEN, Saitama, Japan, February 22, 2002.

“The Low-energy  $L=1$  Strength: Toroidal, Squeezing or Vortex?” at the Joint Institute for Nuclear Research, Dubna, Russia, August 14, 2002.

- “Compressional-mode Giant Resonances and Nuclear Incompressibility,” Argonne National Laboratory, Argonne, Illinois, November 18, 2002.
- “Exotic quantal rotation in nuclei,” Bhabha Atomic Research Center, Mumbai, India, October 7, 2003.
- “Nuclear Incompressibility,” Mumbai University, Mumbai, India, October 8, 2003.
- “Exotic quantal rotation in nuclei,” Tata Institute of Fundamental Research, Mumbai, India, October 15, 2003.
- “Squeezing the nucleus to get the nuclear incompressibility,” Bhabha Atomic Research Center, Mumbai, India, October 17, 2003.
- “Nuclear Incompressibility from the Squeezing Mode,” Saha Institute of Nuclear Physics, Kolkata, India, December 19, 2003.
- “Exotic Quantal Rotation in Nuclei,” Inter University Center for DAE Facilities, Kolkata, India, December 22, 2003.
- “Squeezing the Nucleus to Get the Nuclear Incompressibility,” Institute of Physics, Bhubaneswar, India, January 7, 2004.
- “Exotic Quantal Rotation in Nuclei,” Invited Talk at Nuclear Science Centre, New Delhi, India, February 26, 2004.
- “Squeezing the Nucleus to get the Nuclear Incompressibility,” Triangle Universities Nuclear Laboratory, Duke University, Durham, NC, April 29, 2004.
- “Nuclear Incompressibility and the Compressional-Mode Giant Resonances,” Washington University, St. Louis, Missouri, August 10, 2004.
- “The Nuclear Equation of State,” Graduate Seminar, Inter-University Center, Kolkata, India, October 20, 2004.
- “How far can you squeeze a star? Experimental Determination of Nuclear Incompressibility,” Physics and Astronomy Colloquium, San Diego State University, November 19, 2004.
- “Experimental Determination of Nuclear Incompressibility,” Physics Department Colloquium, Panjab University, Chandigarh, India, January 28, 2005.
- “How Far Can You Squeeze a Star?” Physics Department Colloquium, Clark Atlanta University, Atlanta, Georgia, February 11, 2005.
- “Squeezing the Nucleus to get Nuclear Incompressibility,” TRIUMF Seminar, TRIUMF, Vancouver, Canada, May 12, 2005.

“How Far Can You Squeeze a Star? Experimental Determination of Nuclear Incompressibility,” Seminar at Hampton University, Hampton, VA, February 2, 2006.

“How Far Can You Squeeze a Star? Experimental Determination of Nuclear Incompressibility,” Seminar at University of Richmond, Richmond, VA, February 3, 2006.

“Nuclear Incompressibility from the Compressional-mode Giant Resonances,” Invited seminar, University of Cologne, Germany, June 19, 2006.

“Giant Resonances and Nuclear Incompressibility: An Update,” Seminar at Aizu University, Aizu, Japan, August 11, 2006.

“TSD Bands in  $^{163}\text{Tm}$ : Wobbling vs. Particle Excitations,” Seminar at the Inter University Accelerator Center, New Delhi, December 22, 2006.

“TSD Bands in  $^{163}\text{Tm}$ : Wobbling vs. Particle Excitations,” Seminar at the Bhabha Atomic Research Center, Mumbai, January 9, 2007.

“Nuclear Incompressibility: How Far Can You Squeeze a Star?” Colloquium at the Florida International University, Miami, Florida, January 26, 2007.

“Nuclear Incompressibility, Symmetry Energy, and Neutron Stars,” Seminar at the Tata Institute of Fundamental Research, Mumbai, India, February 7, 2007.

“Nuclear Incompressibility, Symmetry Energy and Neutron Stars,” Nuclear Physics Colloquium, Research Center for Nuclear Physics, Osaka University, Osaka, Japan, March 9, 2007.

“Exotic Quantal Rotation in Nuclei: An experimental Report,” Invited Seminar at the Yukawa Institute for Theoretical Physics, Kyoto University, Kyoto, Japan, July 20, 2007.

“Exotic Quantal Rotation: Chirality and Octupole Condensation,” Colloquium at the Bhabha Atomic Research Center, Trombay, India, January 11, 2008.

“Nuclear Incompressibility and the Stars,” Invited postgraduate talk at the Dungar College, Bikaner, India, January 17, 2008.

“Exotic Quantal Rotation in Nuclei,” Colloquium, Inter University Accelerator Center, New Delhi, India, January 18, 2008.

“Nuclear Incompressibility: How far can you squeeze a star,” Colloquium, Florida A&M University, February 14, 2008.

“Nuclear Incompressibility, Symmetry Energy, and Neutron Stars,” JPS Seminar, Physics Department, Osaka University, Osaka, Japan, May 28, 2008.

“Exotic Quantal Rotation: Wobbling, Chirality and Octupole Condensations,”  
Colloquium, UGC-DAE Consortium for Science Research, Kolkata, India, July 21, 2008.

“2009 Nuclear Incompressibility: How Far Can You Squeeze a Star?” Undergraduate  
Seminar, Hampton University, Hampton, Virginia, February 6, 2009.

“Nuclear Incompressibility, Symmetry Energy, and the MEM Effect from measurements  
of compression-mode giant resonances,” JINA Seminar, Michigan State University, East  
Lansing, Michigan, September 28, 2009.