Taking Nuclei for a Spin

Partha Chowdhury
University of Massachusetts Lowell

Nuclear Physics Over The Years: From the high spin era to rare isotopes

CELEBRATING THE CAREER AND CONTRIBUTIONS OF ROBERT V. F. JANSSENS, UNC, Sep 19-20, 2025

Work supported by the U.S. Department of Energy

Marking time

earlier

in units of Gordon Conferences

somewhat later

now

Between 1983 and 2025, we have co-authored a modest 122 papers

in the beginning…. 1983…. >40 years ago

Volume 131B, number 1,2,3 PHYSICS LETTERS 10 November 1983

ALIGNED $\nu i_{13/2}$ BANDS COUPLED TO DIFFERENT SHAPES IN ^{186}Hg☆

R.V.F. JANSSENS, P. CHOWDHURY[1], H. EMLING[2], D. FREKERS, T.L. KHOO, W. KÜHN[3]
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Y.H. CHUNG, P.J. DALY, Z.W. GRABOWSKI, M. KORTELAHTI
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S. FRAUENDORF[4] and J.Y. ZHANG[5]
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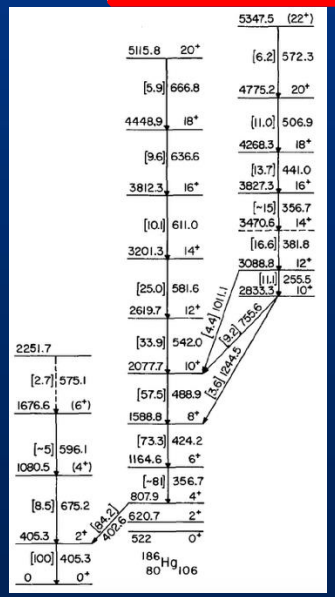
Received 25 March 1983



Argonne Tandem-Linac, ^{34}S beams, NaI Sum Spectrometer, 2-3 Ge(Li), 2 large NaI crystals, liquid scintillators for neutrons

Volume 131B, number 4,5,6 PHYSICS LETTERS 17 November 1983

LEVEL STRUCTURE OF ^{153}Dy AND THE COMPETITION BETWEEN COLLECTIVE AND FEW-PARTICLE EXCITATION MODES IN Dy NUCLEI ☆

M. KORTELAHTI[1], R. BRODA[2], Y.H. CHUNG, P.J. DALY, H. HELPPI[3], J. McNEILL, A. PAKKANEN[1]
Chemistry Department, Purdue University, West Lafayette, IN 47907, USA

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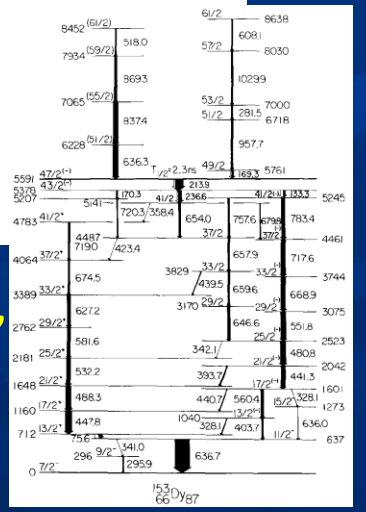
Received 31 May 1983



VOLUME 51, NUMBER 20 PHYSICAL REVIEW LETTERS 14 NOVEMBER 1983

Suppression of Neutron Emission after Heavy-Ion Fusion: Is Shape Relaxation Affected by a Superdeformed Minimum?

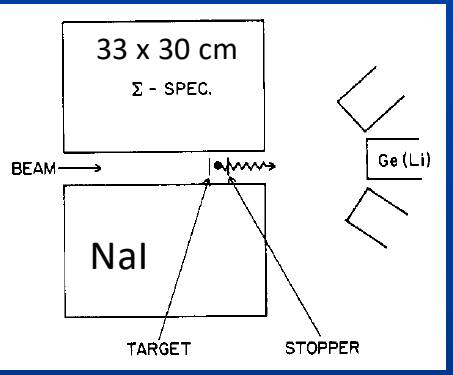
W. Kühn,[(a)] P. Chowdhury,[(b)] R. V. F. Janssens, and T. L. Khoo
Argonne National Laboratory, Argonne, Illinois 60439

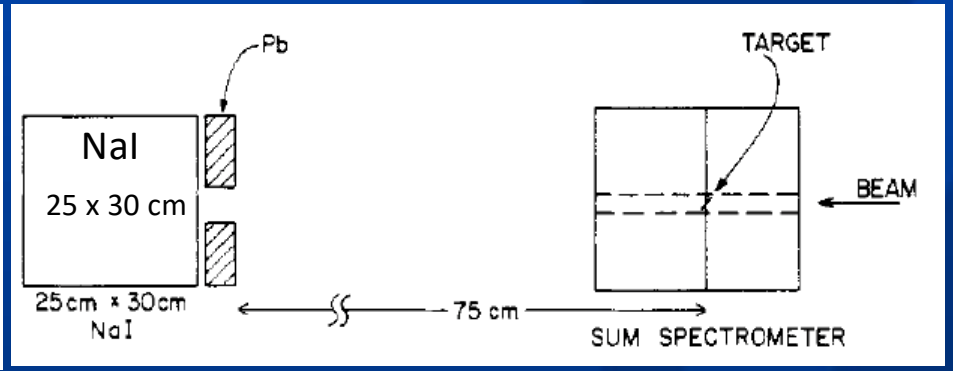
and

F. Haas,[(c)] J. Kasagi,[(d)] and R. M. Ronningen
National Superconducting Cyclotron Laboratory, Michigan State University, East Lansing, Michigan 48824

(Received 26 April 1983)

Sum spectrometers & continuum spectroscopy





Physica Scripta, Vol. 24, 283–289, 1981.

Very High Spin Yrast States and the Link to the Continuum

T. L. Khoo, J. Borggreen,* P. Chowdhury, I. Ahmad and R. K. Smither

Argonne National Laboratory, Argonne, IL 60439, U.S.A.

and

S. R. Faber, P. J. Daly, C. L. Dors and J. Wilson

Purdue University, West Lafayette, IN 47907, U.S.A.

my focus at Argonne, just pre-Robert, learning a lot of new things

VOLUME 47, NUMBER 11 PHYSICAL REVIEW LETTERS 14 SEPTEMBER 1981

Feeding of High-Spin Particle Yrast States by Collective Structures in the Continuum

P. Chowdhury, J. Borggreen,[a] T. L. Khoo, I. Ahmad, and R. K. Smither
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and

S. R. Faber, P. J. Daly, C. L. Dors, and J. Wilson
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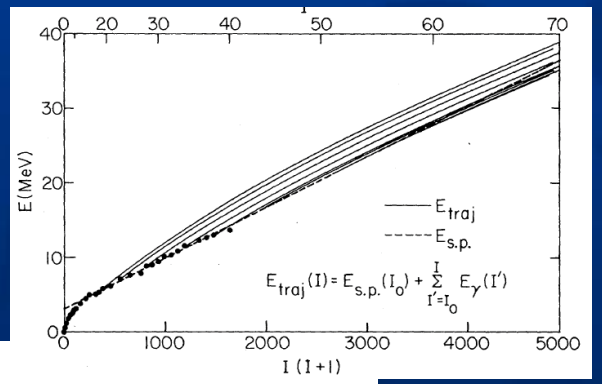
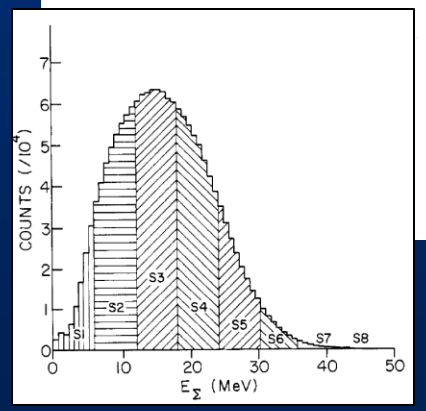
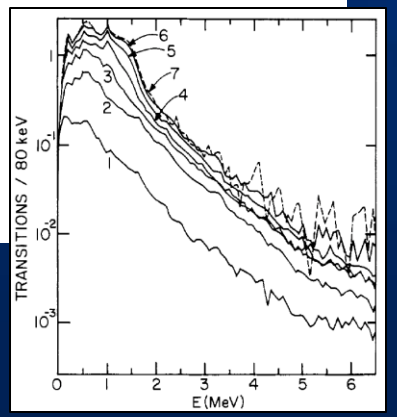
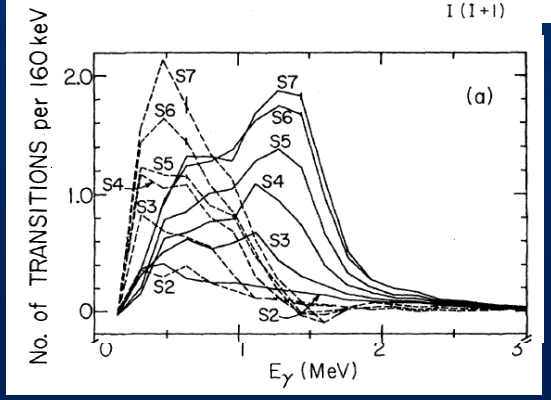
(Received 10 April 1981)





$^{122}Sn(^{34}S,4n)^{152}Dy$





Mid-1980's

PHYSICS LETTERS 2 February 1984

NUCLEON ALIGNMENT TO VERY HIGH SPINS IN ^{147}Gd: RAPID "ROTATION" OF A FERMION SYSTEM

G. SLETTEN, S. BJØRNHOLM, J. BORGGREEN, J. PEDERSEN
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Received 13 September 1983

Nuclear Physics **A443** (1985) 120–134
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NUCLEAR STRUCTURE EFFECTS IN THE FEEDING OF YRAST STATES OF Gd, Dy AND Er NUCLEI

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Received 14 March 1985

Nuclear Physics **A439** (1985) 573–588
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FEEDING TIMES OF HIGH-SPIN STATES IN ^{152,154}Dy: Probes of nuclear structure above the yrast line

F. AZGUI, H. EMLING, E. GROSSE, C. MICHEL*, R.S. SIMON, W. SPRENG and H.J. WOLLERSHEIM
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Received 2 January 1985

Nuclear Physics **A466** (1987) 371–384
North-Holland, Amsterdam

SINGLE PARTICLE RADIATION BETWEEN HIGH SPIN STATES IN ^{147}Gd

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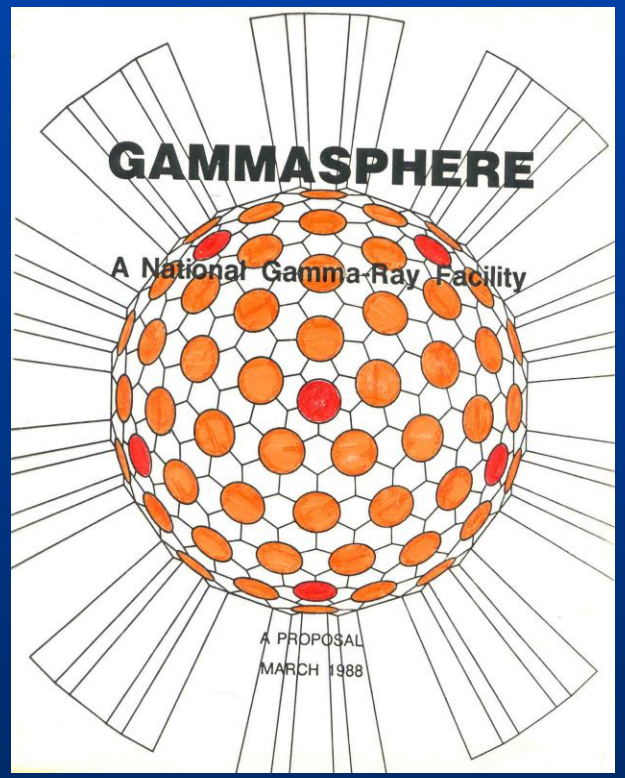
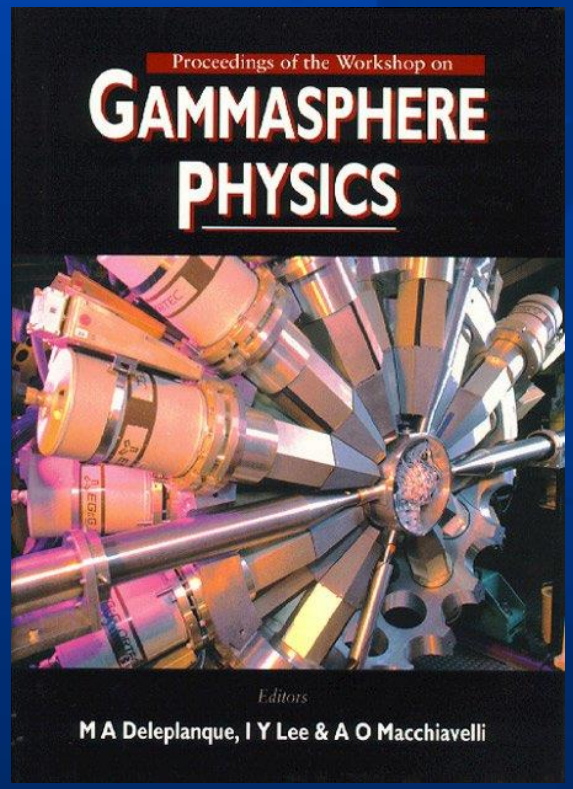
Received 1 December 1986
(Revised 19 December 1986)

Late 1980's to the 1990's



GS proposal 1988



GS dedication 1995

VOLUME 72, NUMBER 8 PHYSICAL REVIEW LETTERS 21 FEBRUARY 1994

Novel Decay Modes of High-K Isomers: Tunneling in a Triaxial Landscape

B. Crowell,* P. Chowdhury,† S. J. Freeman,‡ and C. J. Lister
A. W. Wright Nuclear Structure Laboratory, Yale University, New Haven, Connecticut 06511

M. P. Carpenter, R. G. Henry, R. V. F. Janssens, T. L. Khoo, T. Lauritsen, Y. Liang,§ and F. Soramel‖
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I. G. Bearden
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(Received 28 June 1993)

Meanwhile back at the ranch…

ANL-ND BGO array
12 Compton-suppressed Ge
38-element BGO hexagons

PHYSICAL REVIEW C VOLUME 53, NUMBER 3 MARCH 1996

High-K isomers in ^{176}W and mechanisms of K violation

B. Crowell,* P. Chowdhury,† D. J. Blumenthal,* S. J. Freeman,‡ and C. J. Lister*
Wright Nuclear Structure Laboratory, Yale University, New Haven, Connecticut 06511

M. P. Carpenter, R. G. Henry,§ R. V. F. Janssens, T. L. Khoo, T. Lauritsen, Y. Liang,‖ and F. Soramel¶
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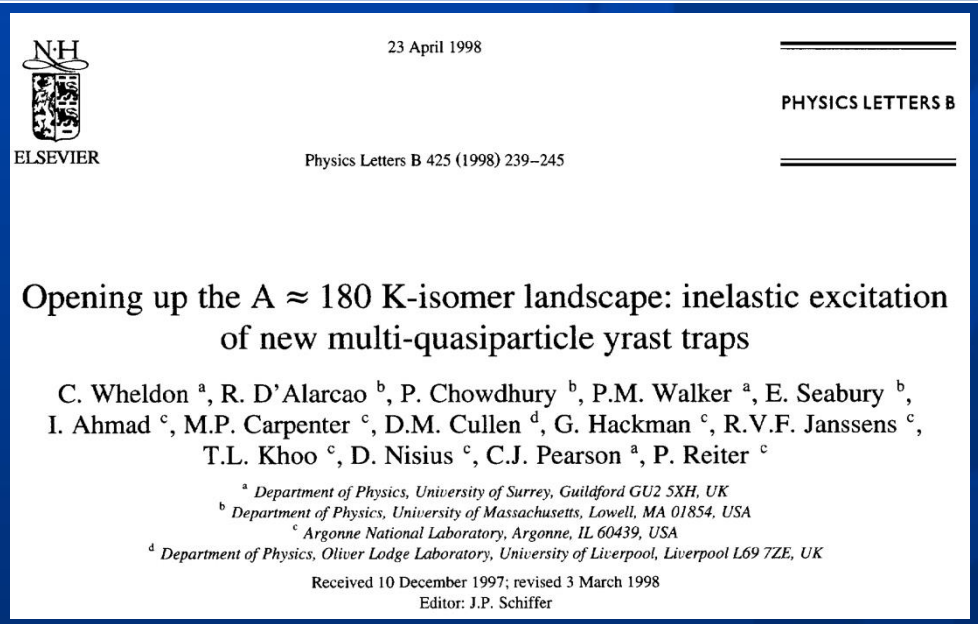
(Received 6 February 1995)

at the turn of the millenium



ELSEVIER

23 April 1998

PHYSICS LETTERS B

Physics Letters B 425 (1998) 239–245

Opening up the A ≈ 180 K-isomer landscape: inelastic excitation of new multi-quasiparticle yrast traps

C. Wheldon [a], R. D'Alarcao [b], P. Chowdhury [b], P.M. Walker [a], E. Seabury [b], I. Ahmad [c], M.P. Carpenter [c], D.M. Cullen [d], G. Hackman [c], R.V.F. Janssens [c], T.L. Khoo [c], D. Nisius [c], C.J. Pearson [a], P. Reiter [c]

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[b] *Department of Physics, University of Massachusetts, Lowell, MA 01854, USA*
[c] *Argonne National Laboratory, Argonne, IL 60439, USA*
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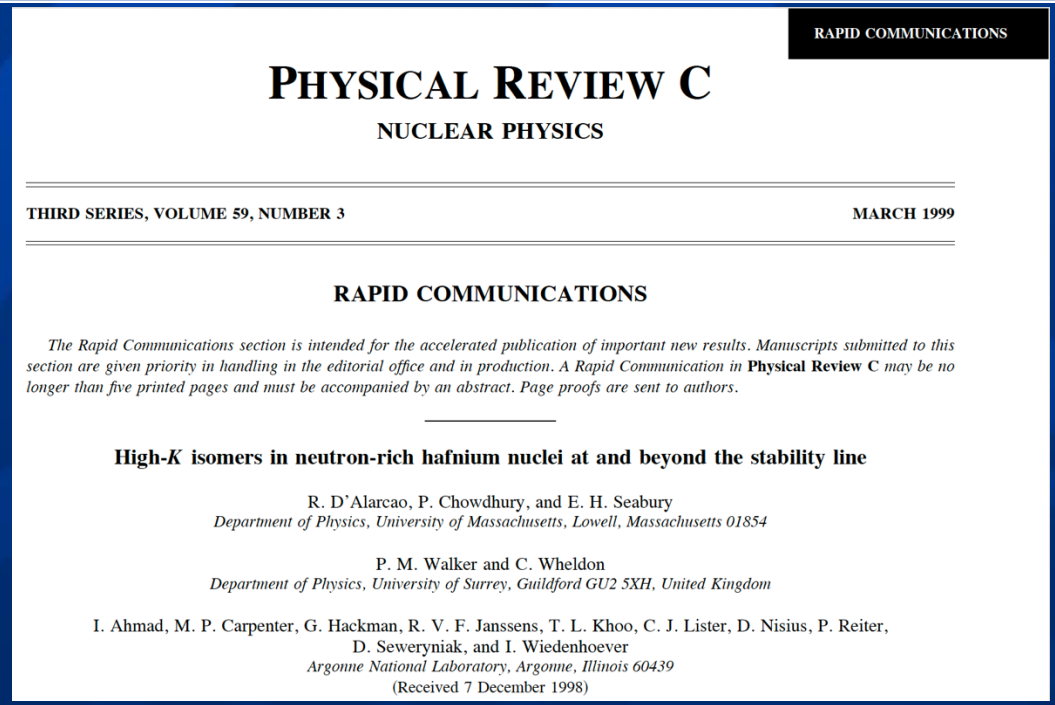
Received 10 December 1997; revised 3 March 1998
Editor: J.P. Schiffer



RAPID COMMUNICATIONS

PHYSICAL REVIEW C

NUCLEAR PHYSICS

THIRD SERIES, VOLUME 59, NUMBER 3 MARCH 1999

RAPID COMMUNICATIONS

The Rapid Communications section is intended for the accelerated publication of important new results. Manuscripts submitted to this section are given priority in handling in the editorial office and in production. A Rapid Communication in **Physical Review C** *may be no longer than five printed pages and must be accompanied by an abstract. Page proofs are sent to authors.*

High-*K* isomers in neutron-rich hafnium nuclei at and beyond the stability line

R. D'Alarcao, P. Chowdhury, and E. H. Seabury
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P. M. Walker and C. Wheldon
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I. Ahmad, M. P. Carpenter, G. Hackman, R. V. F. Janssens, T. L. Khoo, C. J. Lister, D. Nisius, P. Reiter, D. Seweryniak, and I. Wiedenhoever
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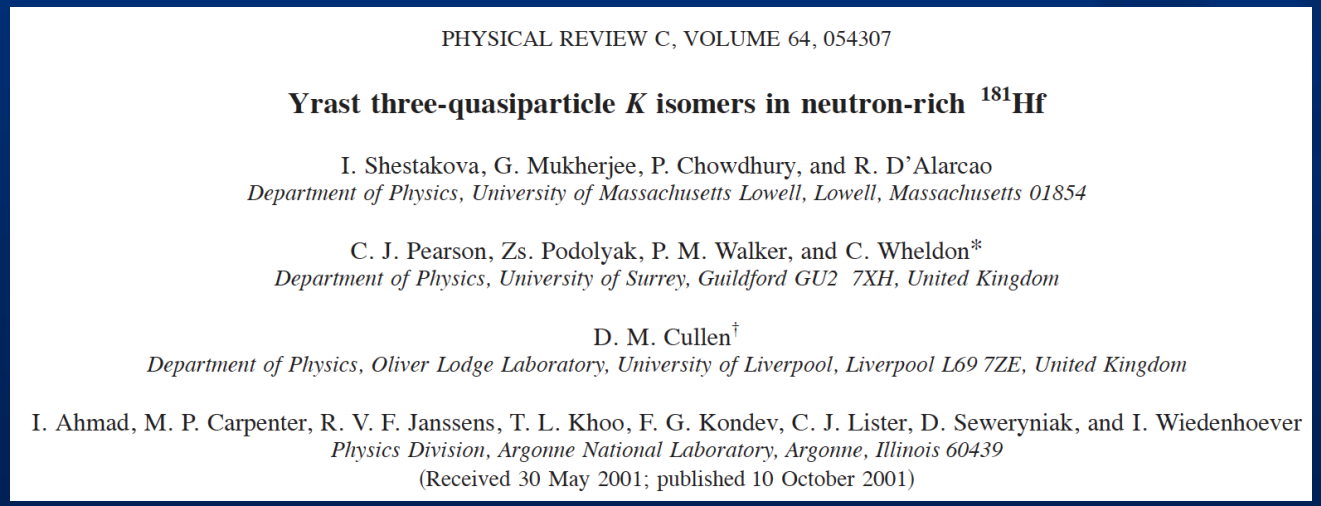
(Received 7 December 1998)



PHYSICAL REVIEW C, VOLUME 64, 054307

Yrast three-quasiparticle *K* isomers in neutron-rich ^{181}Hf

I. Shestakova, G. Mukherjee, P. Chowdhury, and R. D'Alarcao
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I. Ahmad, M. P. Carpenter, R. V. F. Janssens, T. L. Khoo, F. G. Kondev, C. J. Lister, D. Seweryniak, and I. Wiedenhoever
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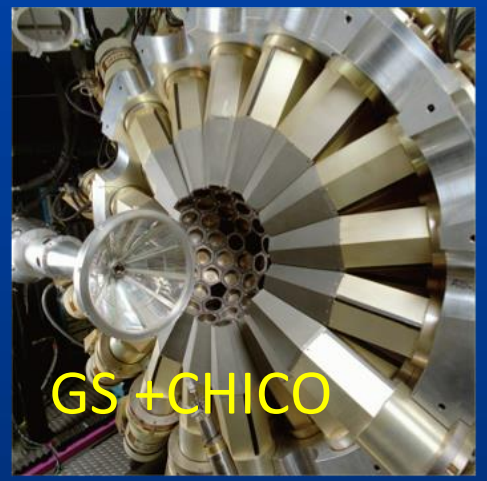
(Received 30 May 2001; published 10 October 2001)

Accessing K-isomers in the neutron-rich A~180 region via inelastic excitation and transfer and Gammasphere

Late 2000's



^{180}Hf beam on ^{232}Th

PRL **101,** 182503 (2008) PHYSICAL REVIEW LETTERS week ending 31 OCTOBER 2008

Collective Oblate Rotation at High Spins in Neutron-Rich ^{180}Hf

U. S. Tandel,[1] S. K. Tandel,[1] P. Chowdhury,[1] D. Cline,[2] C. Y. Wu,[2,*] M. P. Carpenter,[3] R. V. F. Janssens,[3] T. L. Khoo,[3] T. Lauritsen,[3] C. J. Lister,[3] D. Seweryniak,[3] and S. Zhu[3]

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[3]*Physics Division, Argonne National Laboratory, Argonne, Illinois 60439, USA*
(Received 13 May 2008; revised manuscript received 13 August 2008; published 30 October 2008)

^{209}Bi, ^{207}Pb beams on ^{248}Cm,^{249}Cf

RAPID COMMUNICATIONS

PHYSICAL REVIEW C **82**, 041301(R) (2010)

Rotational bands in odd-*A* Cm and Cf isotopes: Exploring the highest neutron orbitals

S. K. Tandel,[1,*] P. Chowdhury,[1] S. Lakshmi,[1] U. S. Tandel,[1] I. Ahmad,[2] M. P. Carpenter,[2] S. Gros,[2,†] R. V. F. Janssens,[2] T. L. Khoo,[2] F. G. Kondev,[2] J. P. Greene,[2] D. J. Hartley,[3] T. Lauritsen,[2] C. J. Lister,[2] D. Peterson,[2] A. Robinson,[2,‡] D. Seweryniak,[2] and S. Zhu[2]

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(Received 20 August 2010; published 4 October 2010)

Heavy beams on radioactive targets

2010's

Physics Letters B 739 (2014) 13–18

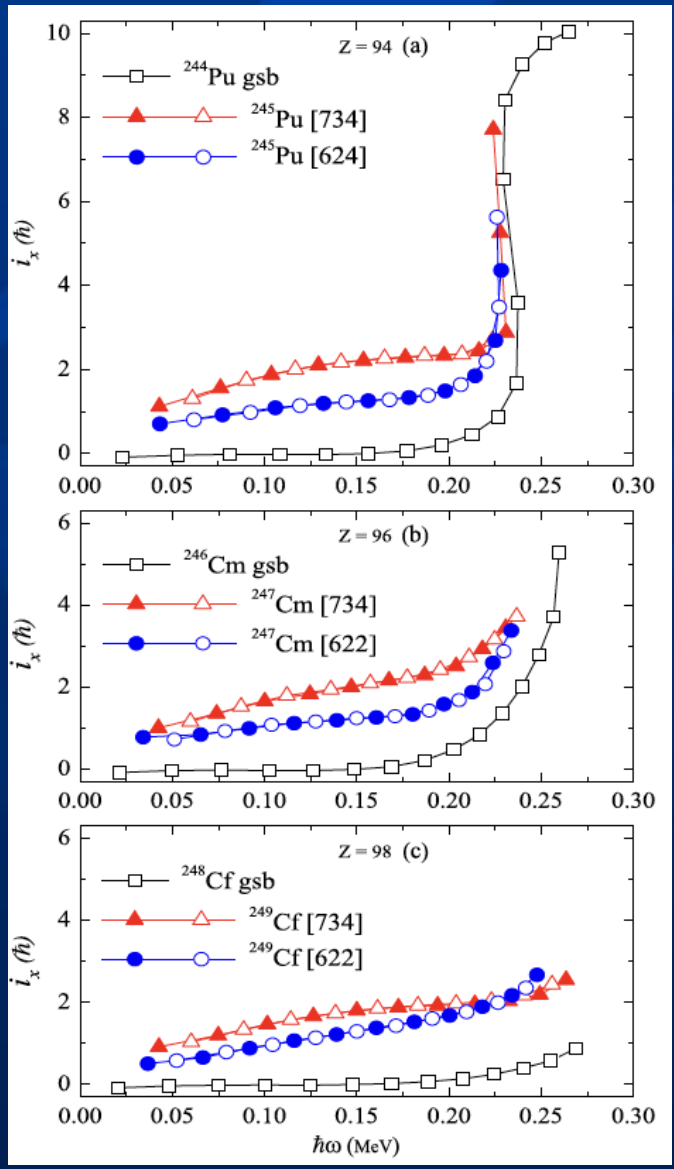
Contents lists available at ScienceDirect

Physics Letters B

www.elsevier.com/locate/physletb

$N = 151$ Pu, Cm and Cf nuclei under rotational stress: Role of higher-order deformations

S.S. Hota [a,1], P. Chowdhury [a,*], T.L. Khoo [b], M.P. Carpenter [b], R.V.F. Janssens [b], Y. Qiu [a], I. Ahmad [b], J.P. Greene [b], S.K. Tandel [a,2], D. Seweryniak [b], S. Zhu [b], P.F. Bertone [b,3], C.J. Chiara [b,c], A.Y. Deo [a,4], N. D'Olympia [a], S. Gros [b,5], C.J. Guess [a,6], T. Harrington [a], D.J. Hartley [d], G. Henning [b,7], C.R. Hoffman [b], E.G. Jackson [a], F.G. Kondev [b], S. Lakshmi [a,8], T. Lauritsen [b], C.J. Lister [a], E.A. McCutchan [b,9], K. Moran [a], C. Nair [b], D. Peterson [b], U. Shirwadkar [a,8], I. Stefanescu [b,c,10]



^{208}Pb on ^{244}Pu

^{209}Bi on ^{248}Cm

^{208}Pb on ^{249}Cf

+ more manuscripts on related measurements in this period with heavy beams and radioactive targets in the pipeline

a moving experience

Robert Janssens

Robert and I did not always see eye to eye on things….

But when we pulled in the same direction we were MIGHTY strong

Best wishes for the future and fond memories from the past.

KIM

To Robert

We have meandered through a lot of physics, instrumentation and life together. We have spun high, evolved in shape, and measured half-lives over more than half our lives. Cheers to a life of friendship!