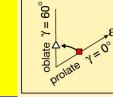
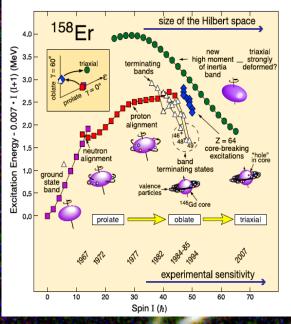
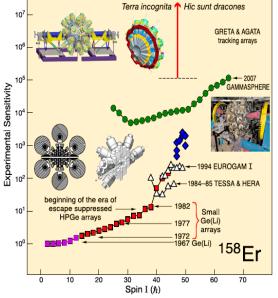
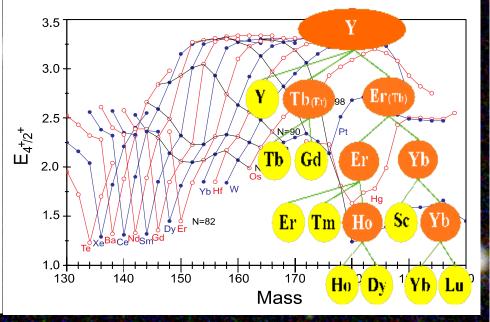
Systematics of Band Termination at High-Spin in N~90 Nuclei: How Robust and Pure Are These Special States? Mark A. Riley - Florida State University (+ LOTS OF FRIENDS!)





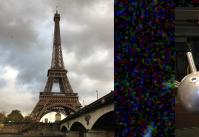


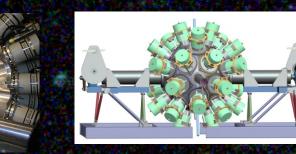


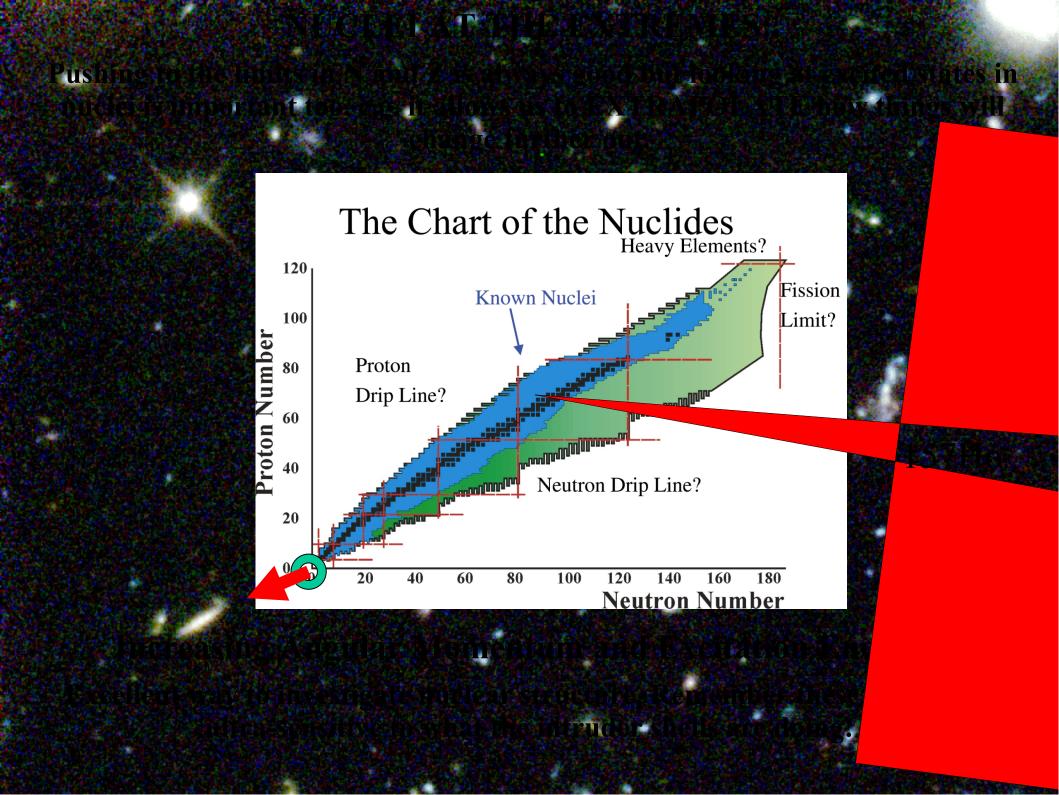










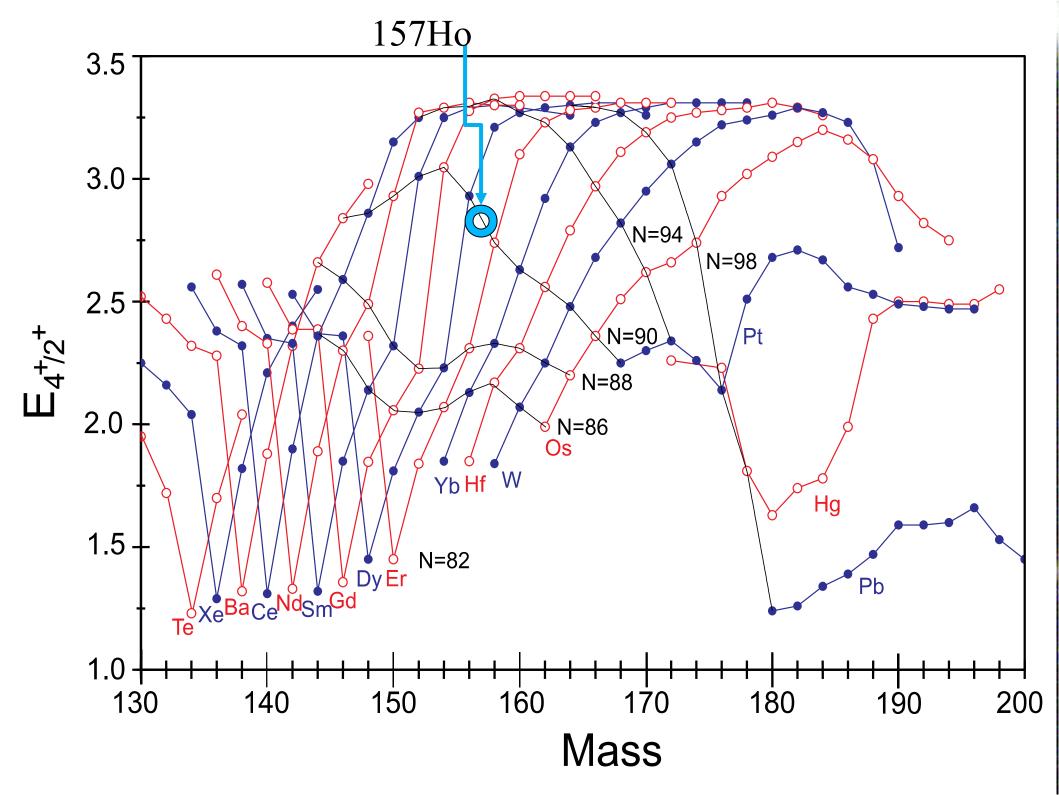


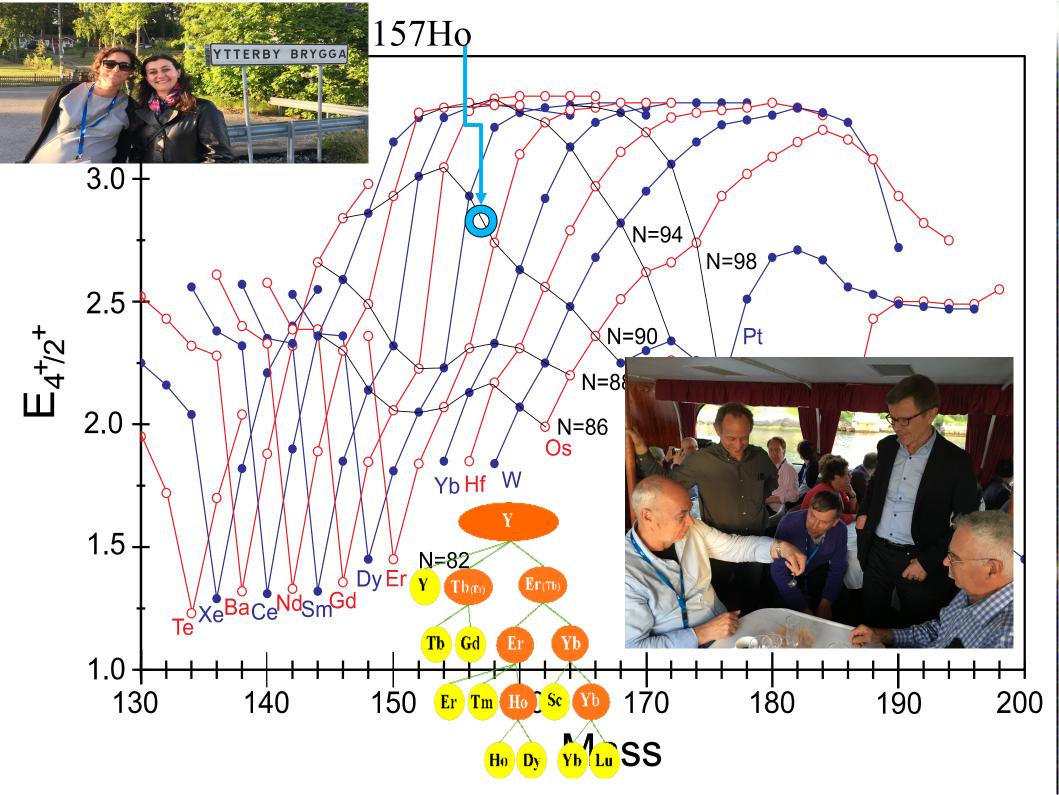
It is fun to look at rotating object

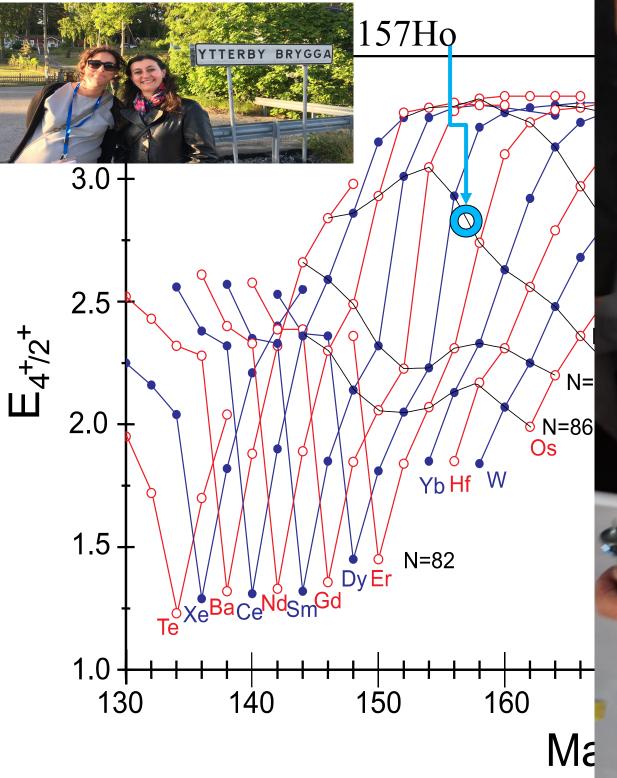


It is fun to look at rotating objec



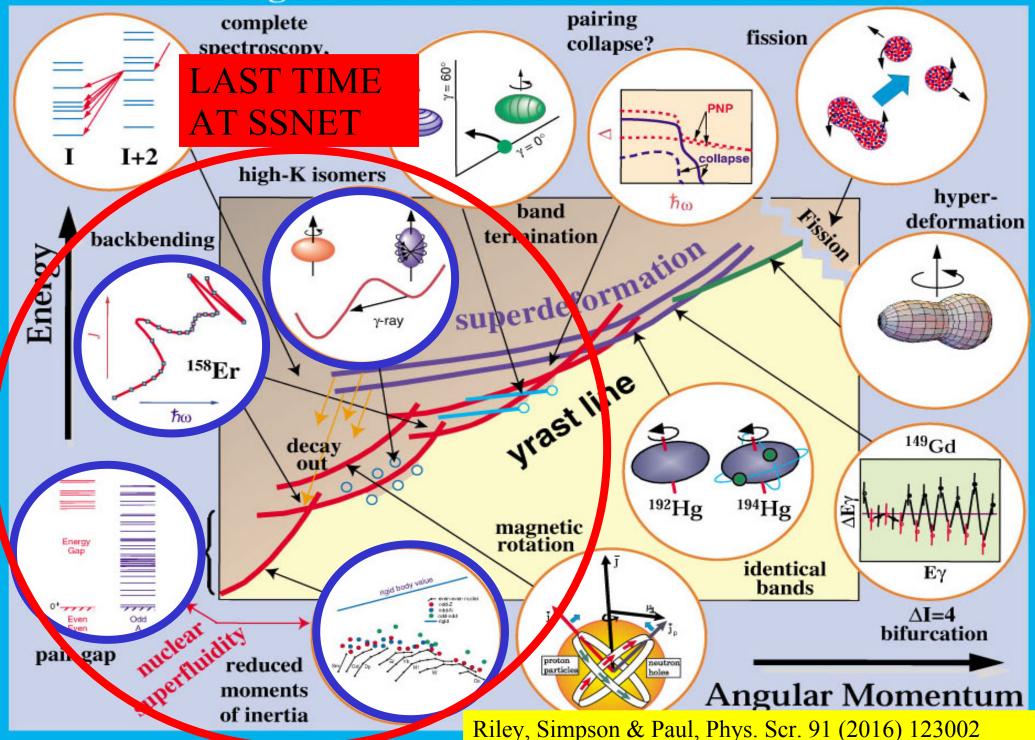








The Angular Momentum World of the Nucleus



WILEY-VCH

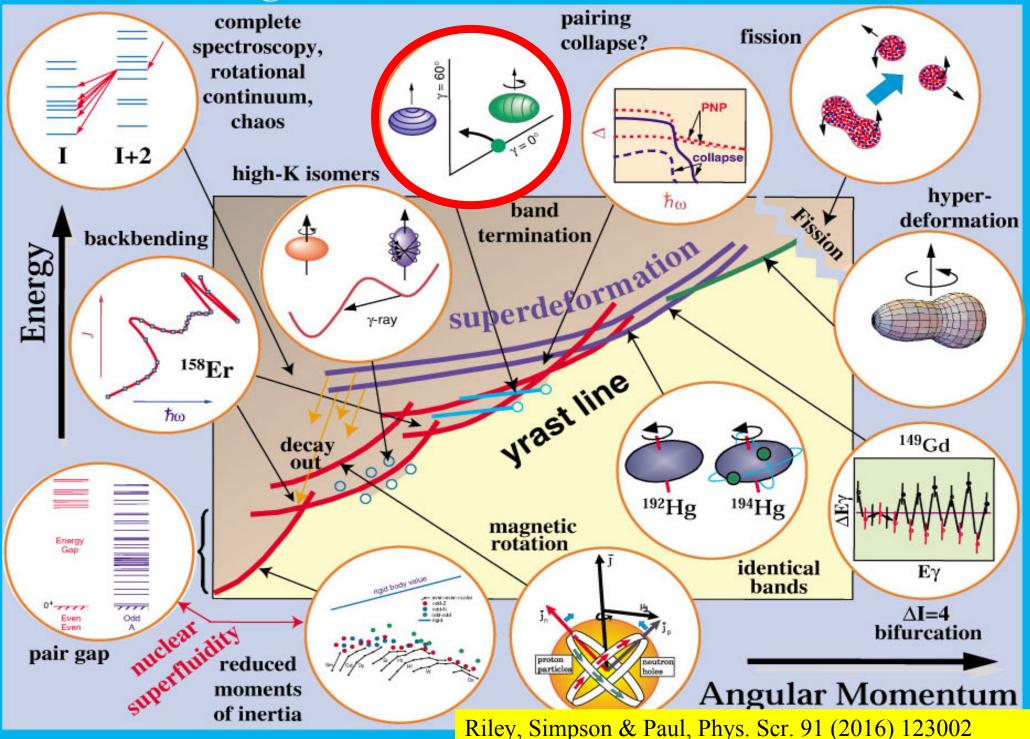
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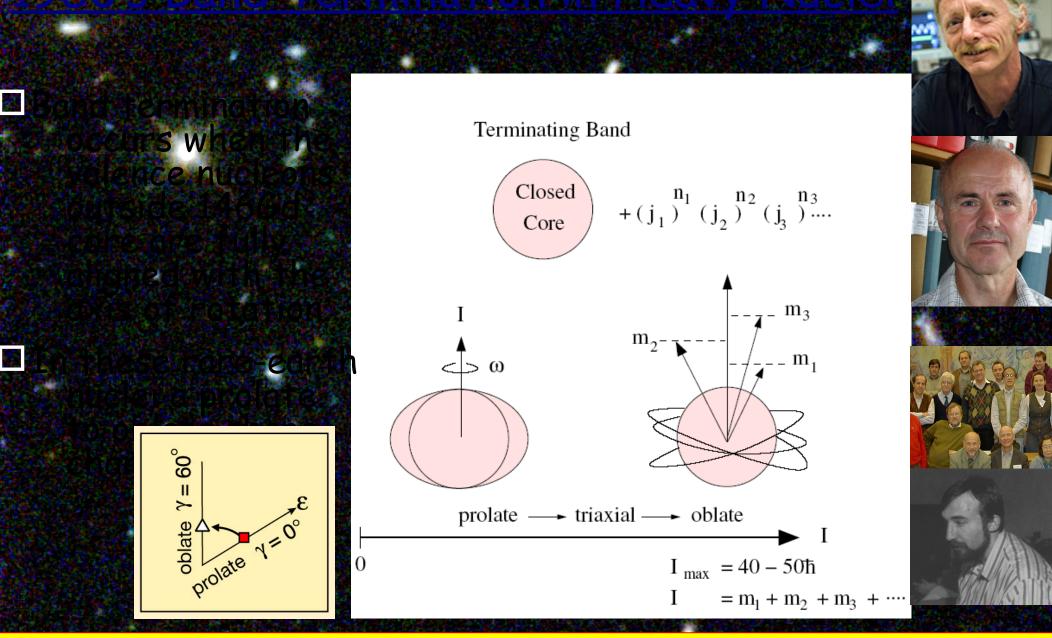
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Vladimir Zelevinsky and Alexander Volya

Physics of Atomic Nuclei

The Angular Momentum World of the Nucleus



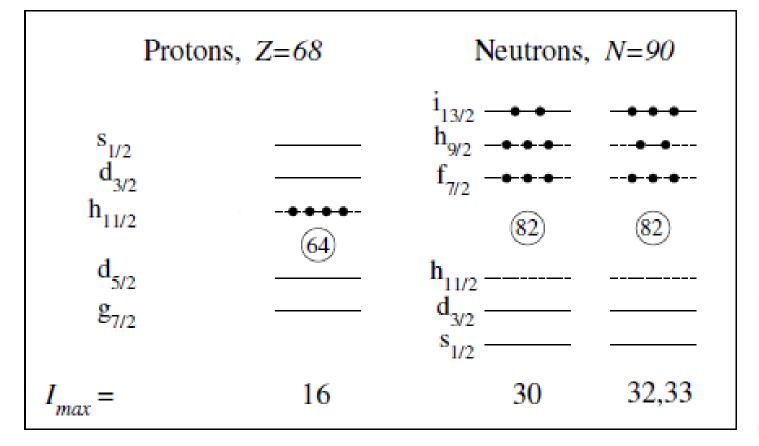


T.Bengtsson and I.Ragnarsson, Physica Scripta T5 (1983) 165

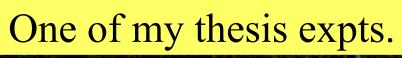
I. Ragnarsson, T. Bengtsson, W. Nazarewicz, J. Dudek, and G. A. Leander; PRL 54, (1985) 982

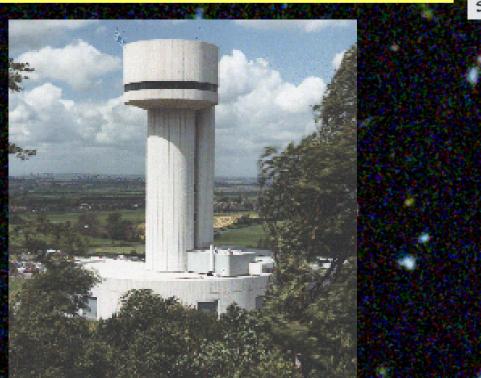
I. Ragnarsson, T. Xing, T. Bengtsson and M.A. Riley, Phys. Scripta 34 (1986) 651.

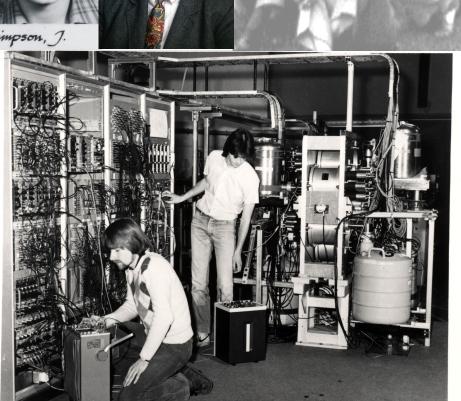
¹⁵⁸Er: Filled orbitals relative to ¹⁴⁶Gd core.



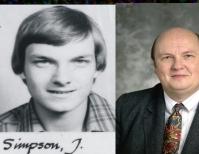
















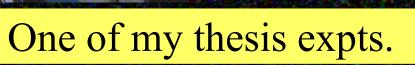


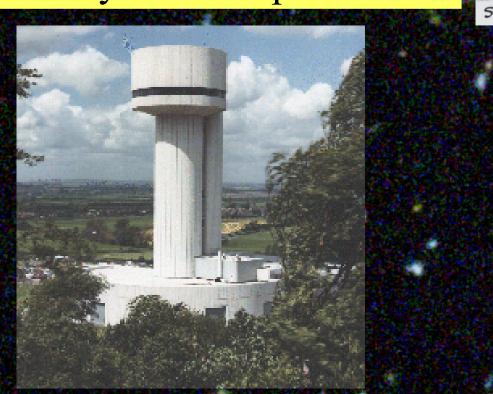
One of my thesis expts.

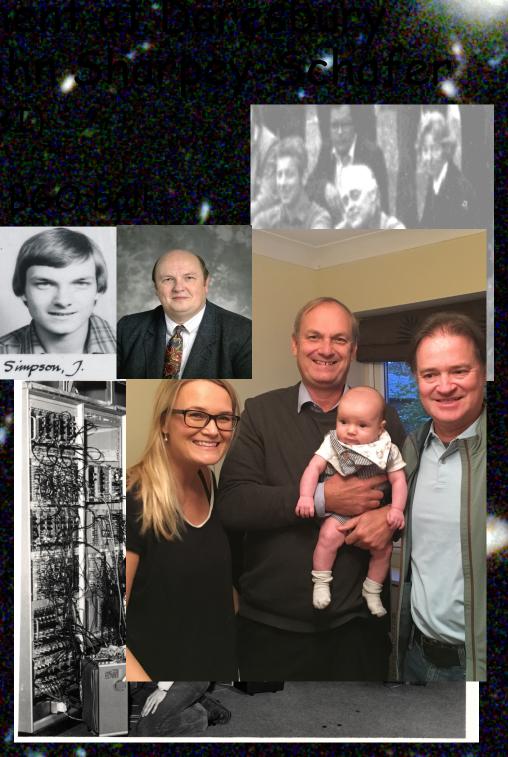




4 days ago!

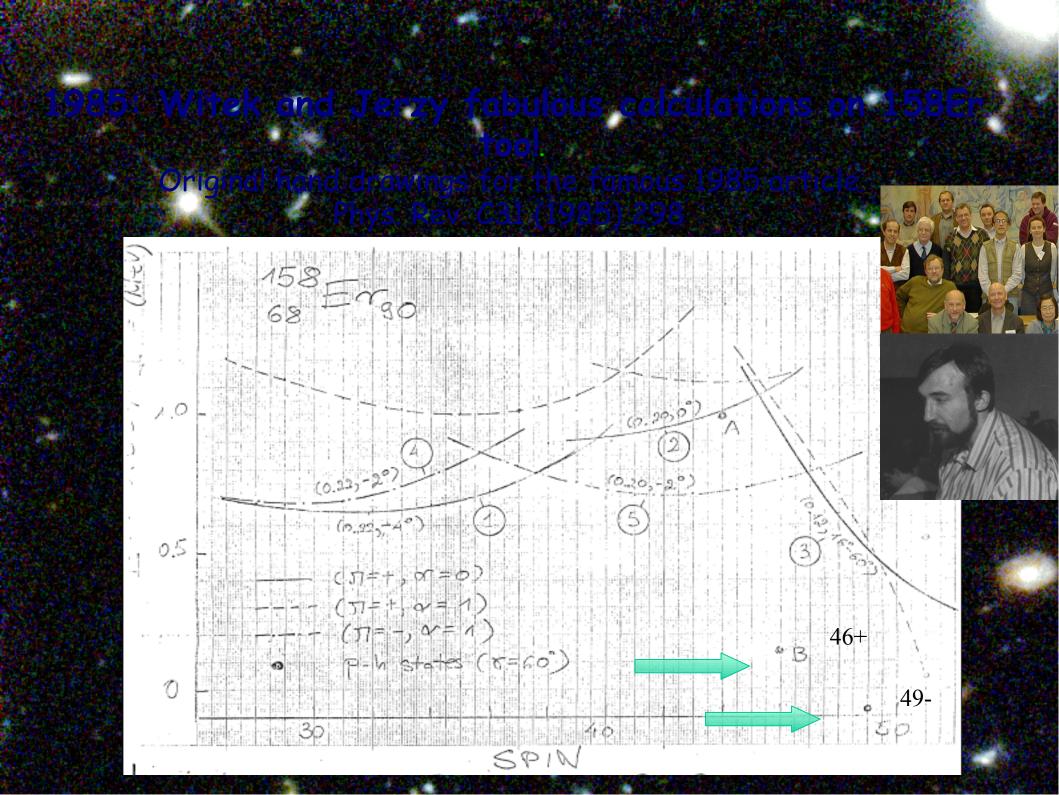












$\varepsilon_2 = -0.10 \ (\gamma = 60^{\circ})$ NEUTRONS, N=90 46+ in 158Er 7.0 7.2 Neutrons 7.0 **30**⁺ħ 6.8 6.8 $\mathrm{E_{s.p.}}(\hbar\omega_0)$ (⁰θμ)^{6.6} 6.4 **H**^{6.6} 6.2 6.6 ⁄ h_{9/2} $f_{7/2}$ 6.4 6.2 ¹⁵⁸Er (82)6.0 6.2 5.8 In=30 I_n ≥0 v(f712 h912)6(i1312)2 6.0 5.6 (b) (a) 13/2 -13/25/29/2 _Q. -0.20.0 0.2 Ω Deformation ε₂ 6.8 Protons 6.6-6.4 $E_{s.p.}(\hbar\omega_0)$ i 13/2 h_{9/2} 6.2 16⁺ħ ¹⁵⁸Er 6.0

, h_{11/2}

13/2

9/2



of the

Zdzislaw Szymanski

Ω

5/2

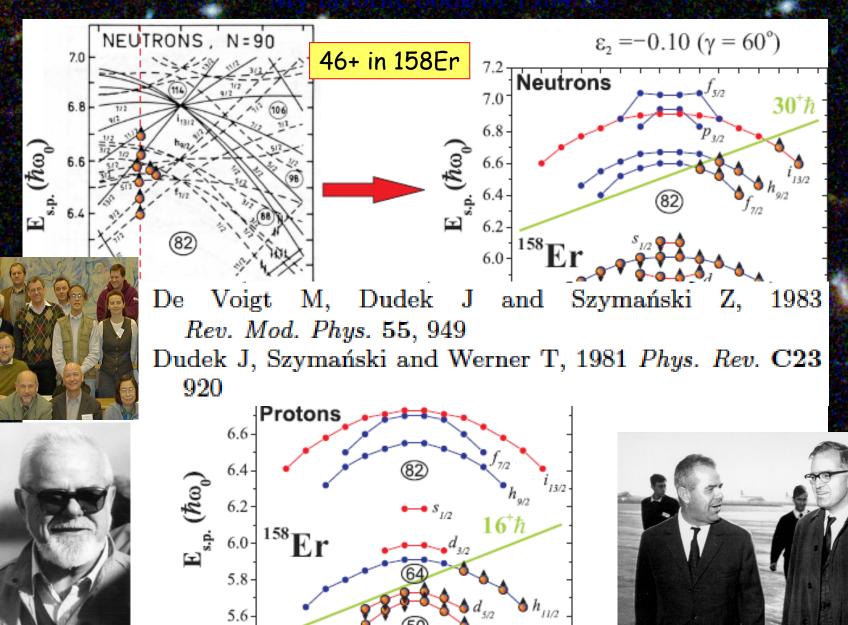
-5/2 -1/2 1/2

5.8

5.6

-13/2 -9/2

(c) 5.4



Zdzislaw Szymanski

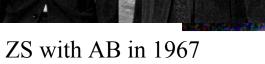
(C) 5.4

Ω

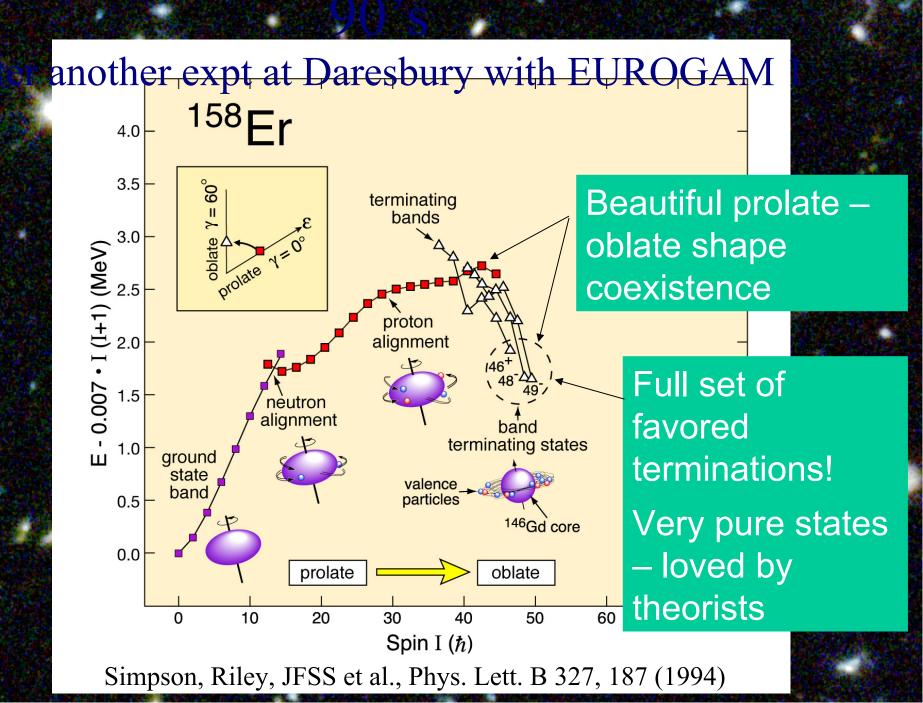
9/2

13/2

-13/2 -9/2 -5/2 -1/2 1/2 5/2



of the



Using the purity of BT states to good effect!

PHYSICAL REVIEW C 71, 024305 (2005)

Probing the nuclear energy functional at band termination



Honorata Zduńczuk,^{1,*} Wojciech Satuła,^{1,2,†} and Ramon A. Wyss^{2,‡} *ute of Theoretical Physics, University of Warsaw, ul. Hoża 69, PL-00 681 Warsaw, Royal Institute of Technology), AlbaNova University Center, SE-106 91 Stockholm* d 29 June 2004; revised manuscript received 22 November 2004; published 9 Febru

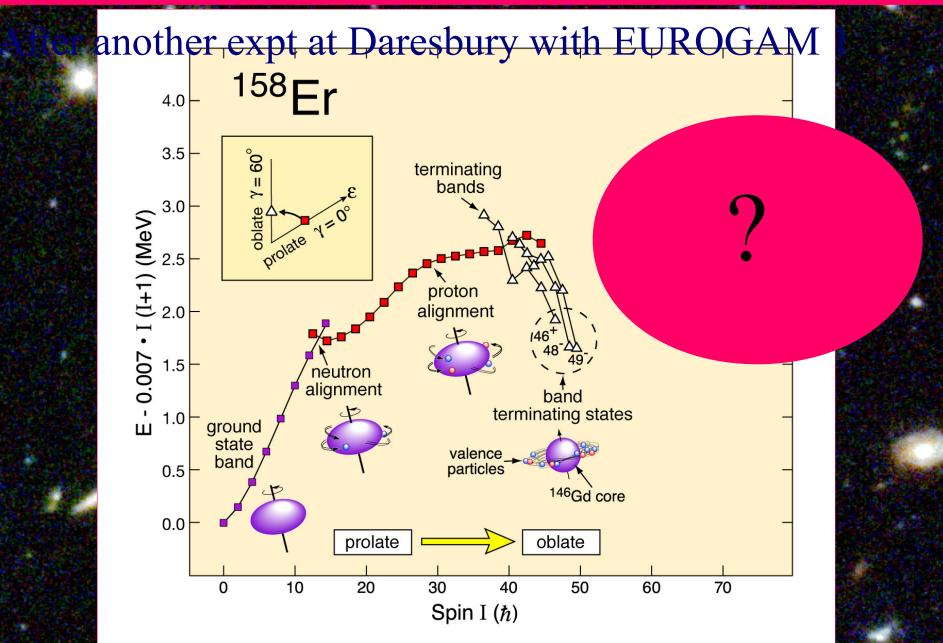
A systematic study of terminating states in the A mass region using the self-consistent Skyrme-Hartree-Fock model is presented. The objective of this study is to demonstrate that the terminating states, due to their intrinsic simplicity, offer unique and so far unexplored opportunities to study different aspects of the effective NN interaction or nuclear local energy density functional. In particular, we show that the agreement of the calculations to the data depends on the spin fields and the spin-orbit term which, in turn, allows us to constrain the appropriate Landau parameters and the strength of the spin-orbit potential. The present study reveals that the structure and energy of terminating states can be used as a tool to differentiate among the many Skyrme force parametrizations.

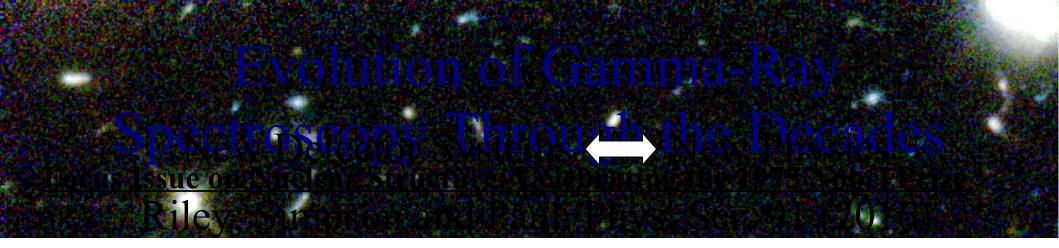
DOI: 10.1103/PhysRevC.71.024305

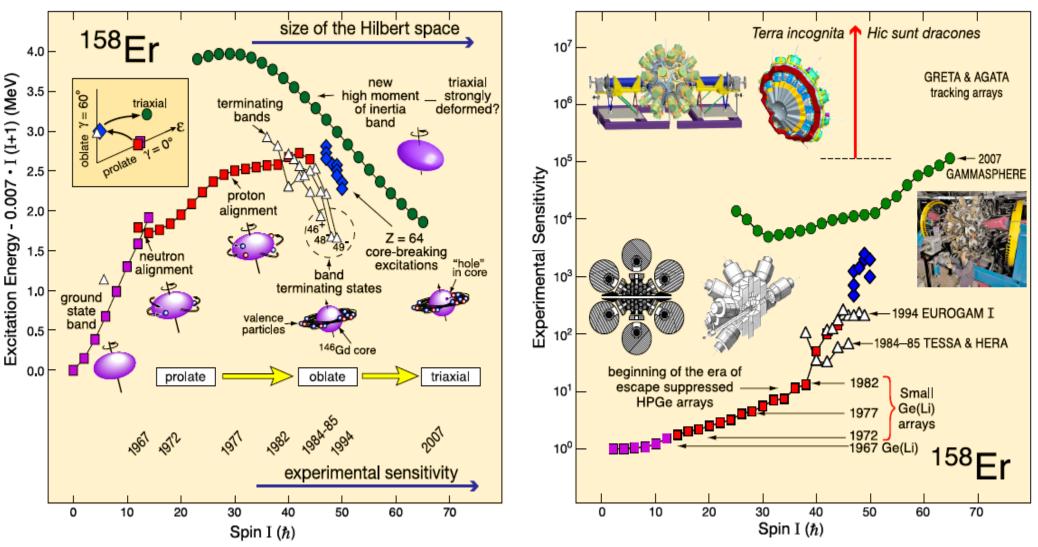
PACS number(s): 21.30.Fe, 21.60.Jz

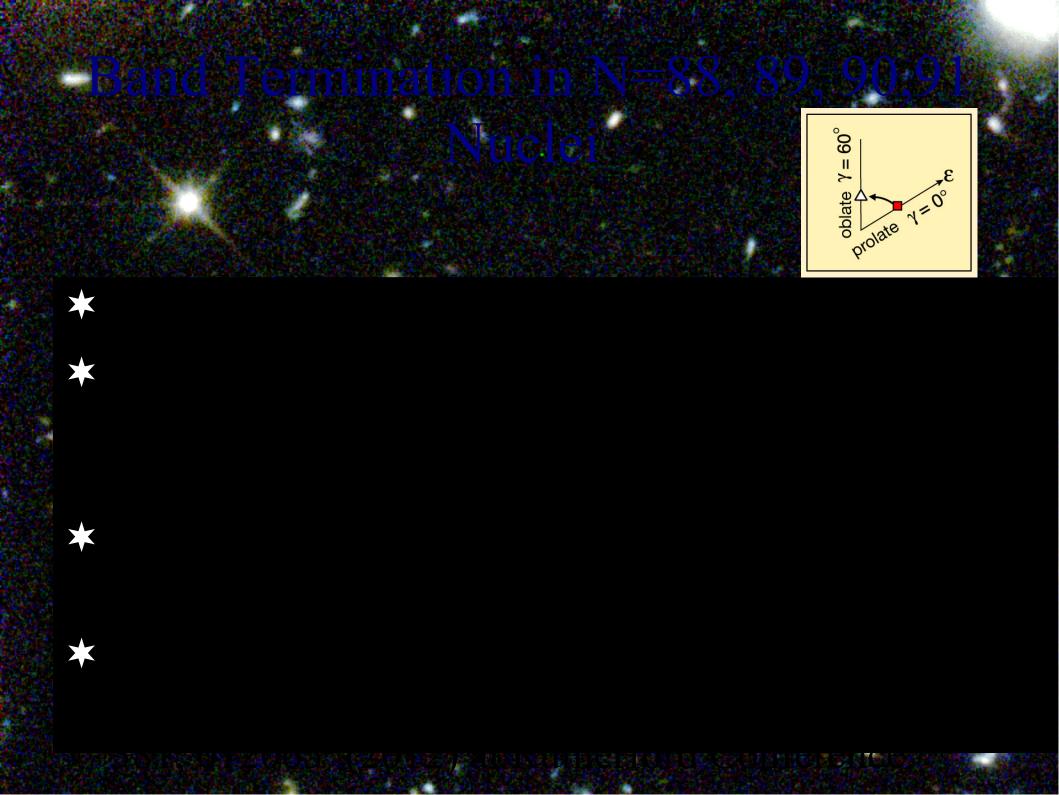
Review Paper on Band Termination States see, Afanasjev, Fossan, Lane and Ragnarsson, Phys. Rep. 322 (1999) 1

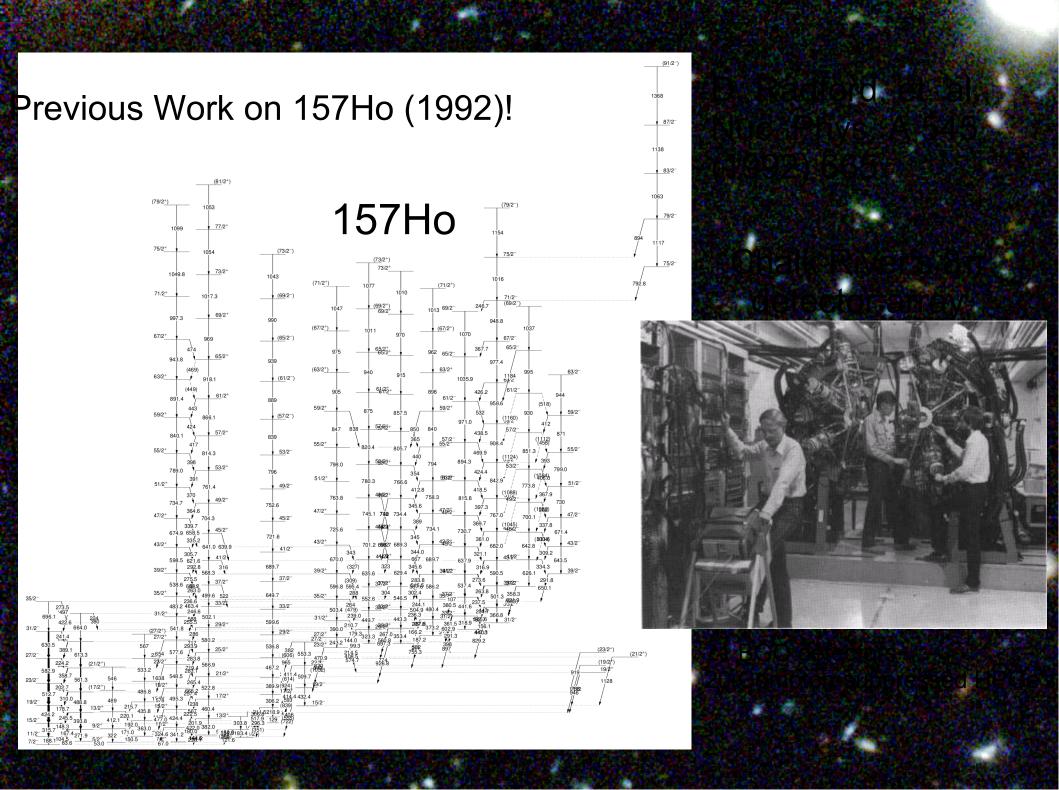
BUT WHAT LIES ABOVE BAND TERMINATION?





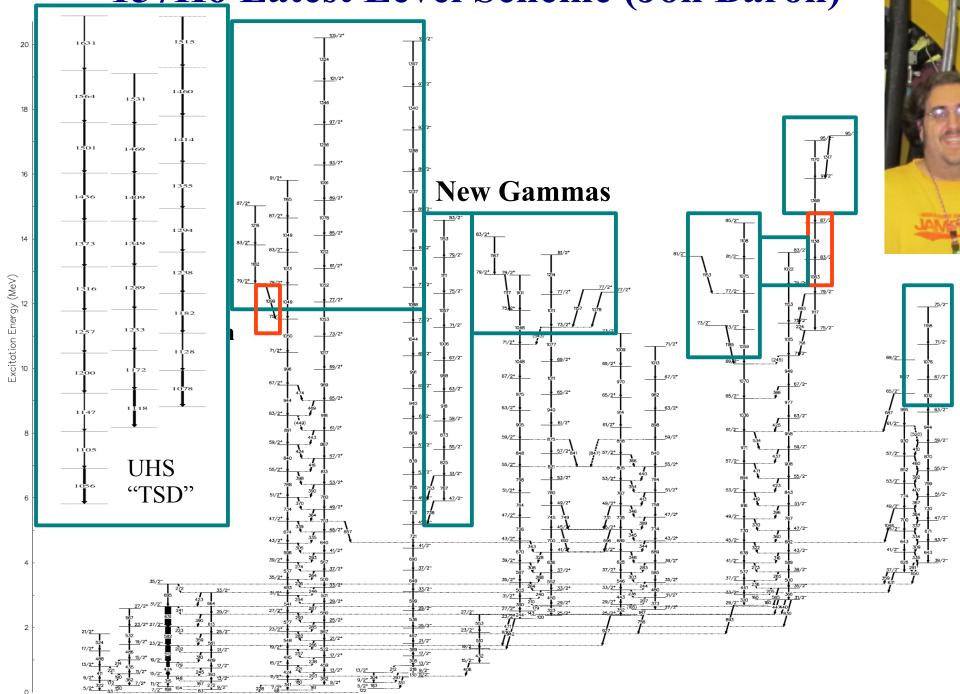


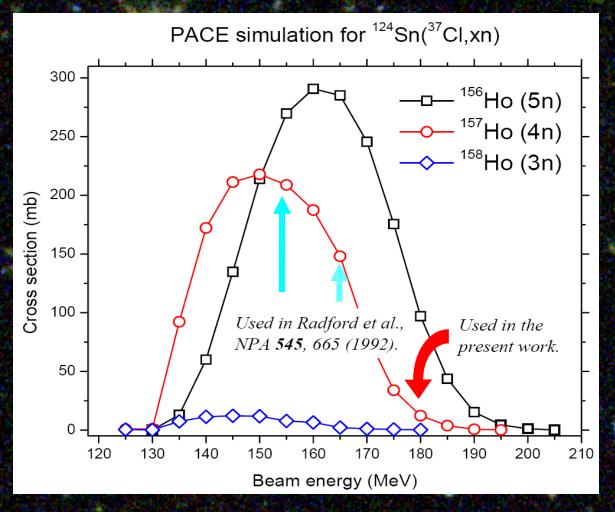




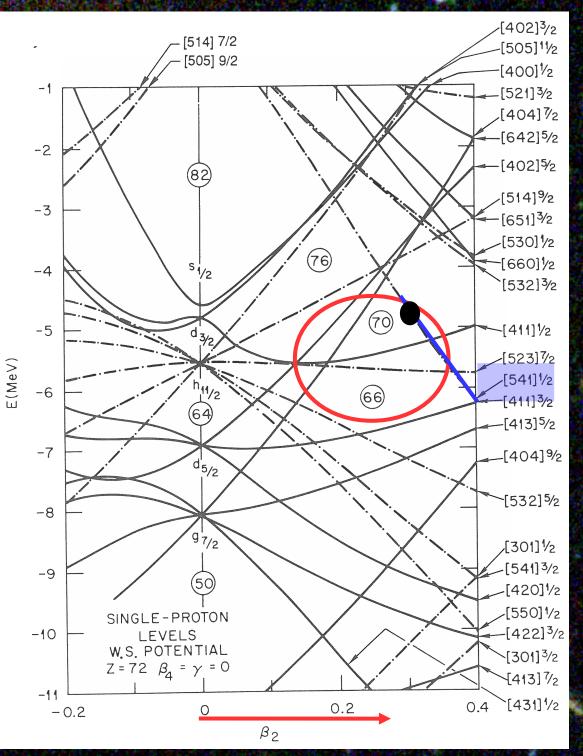


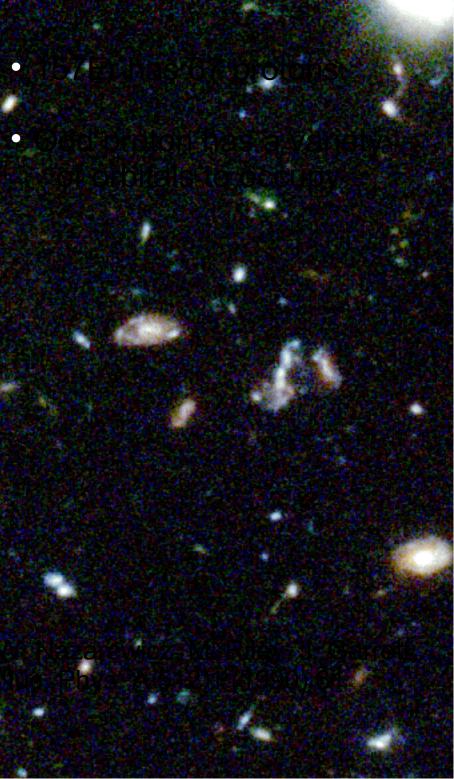
<u>157Ho</u> Latest Level Scheme (Jon Baron)

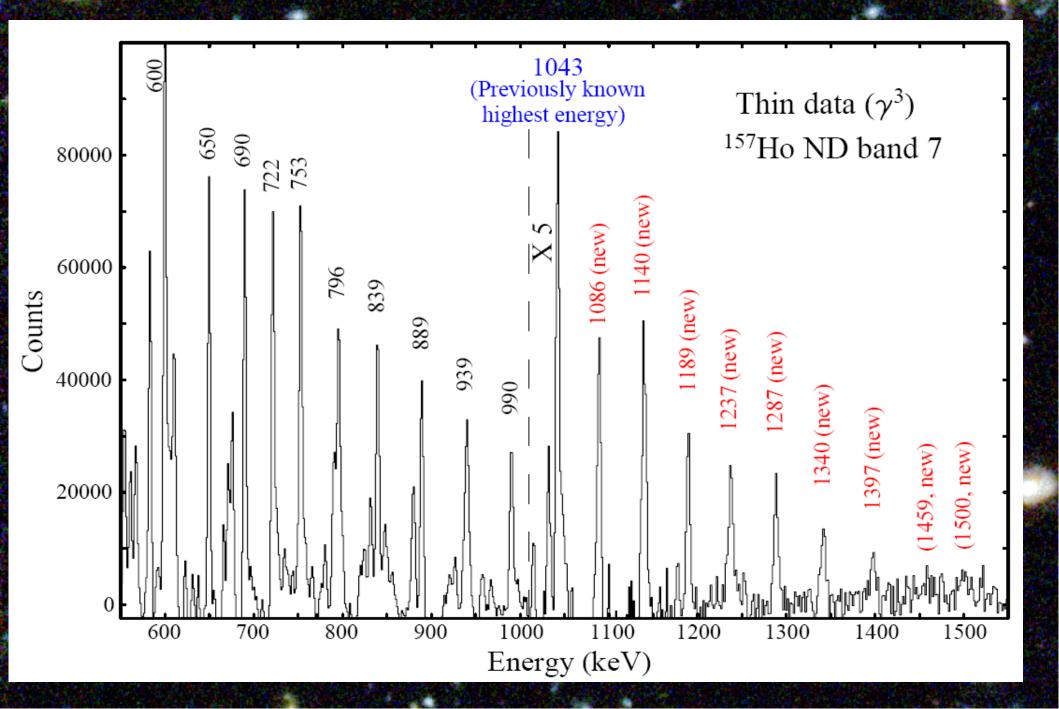


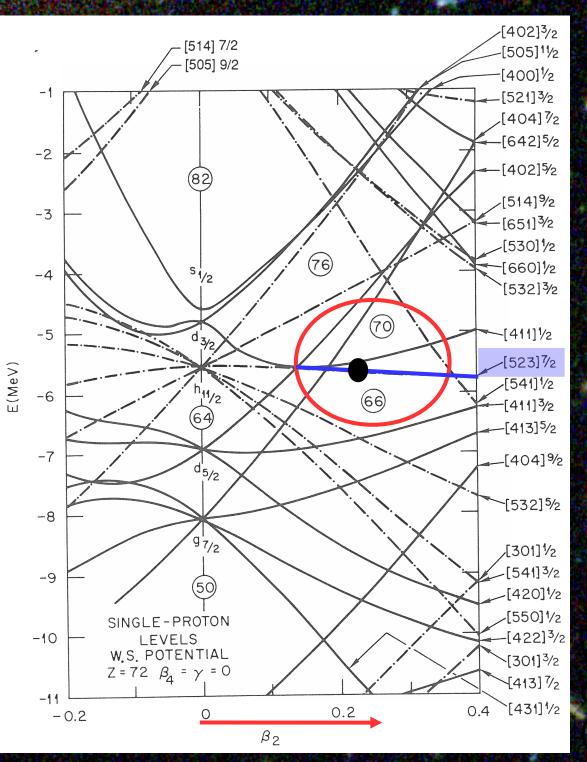


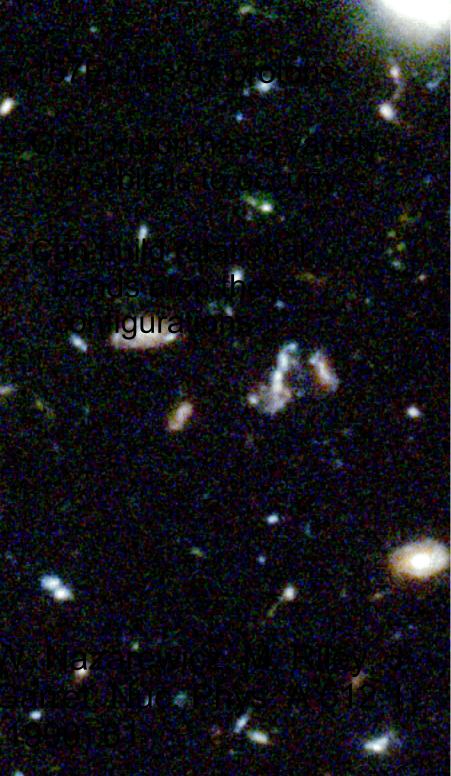


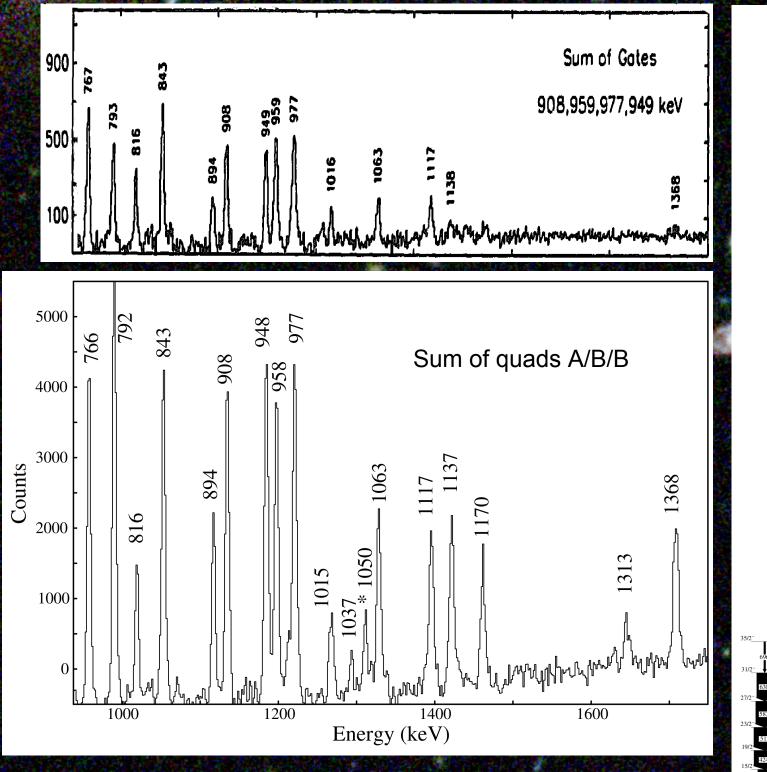


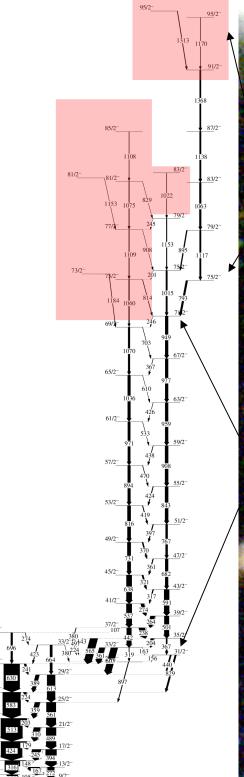


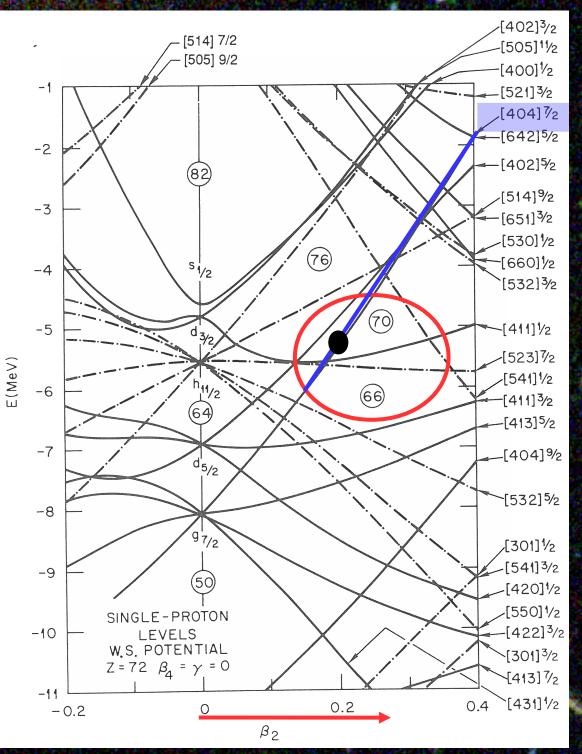


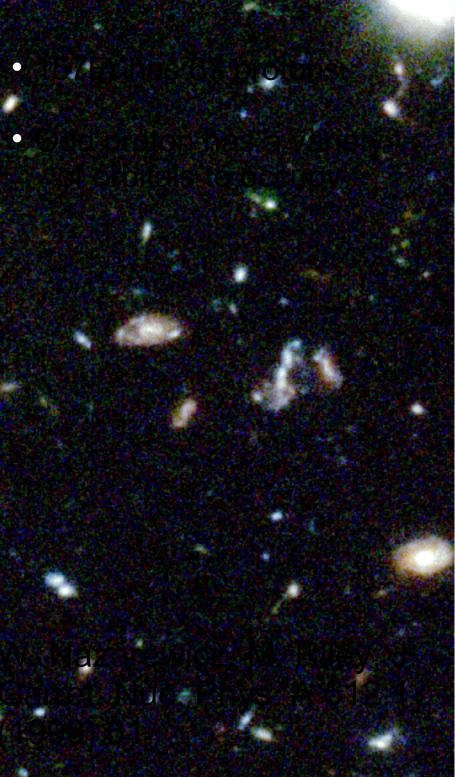


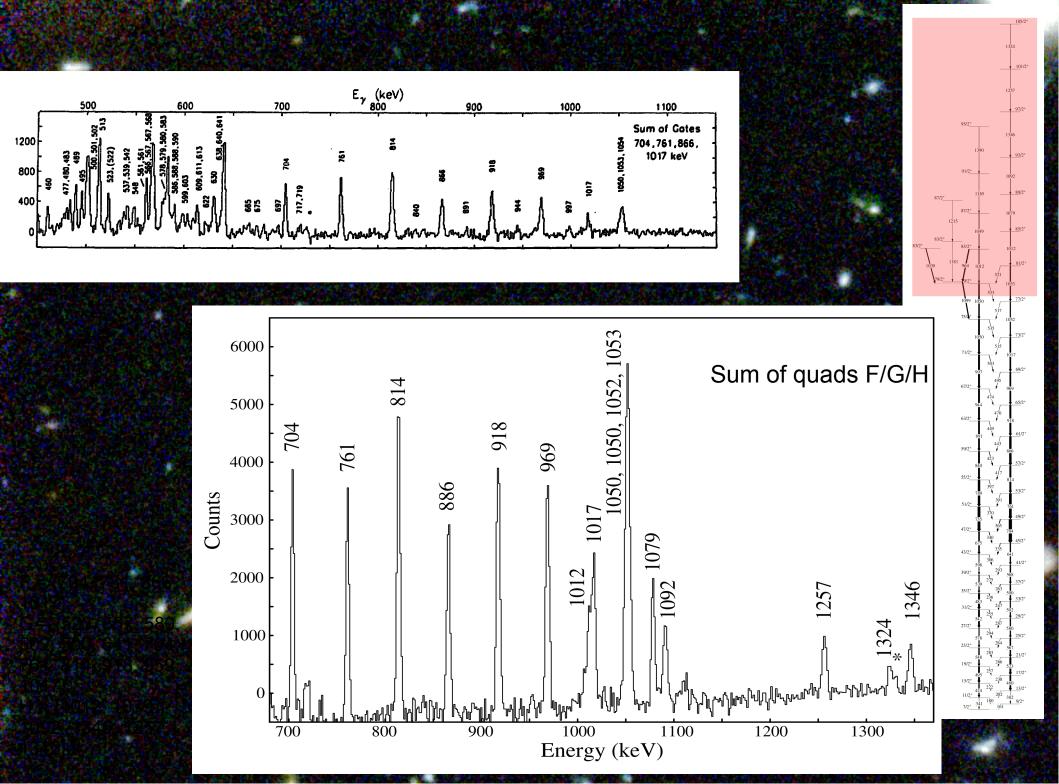


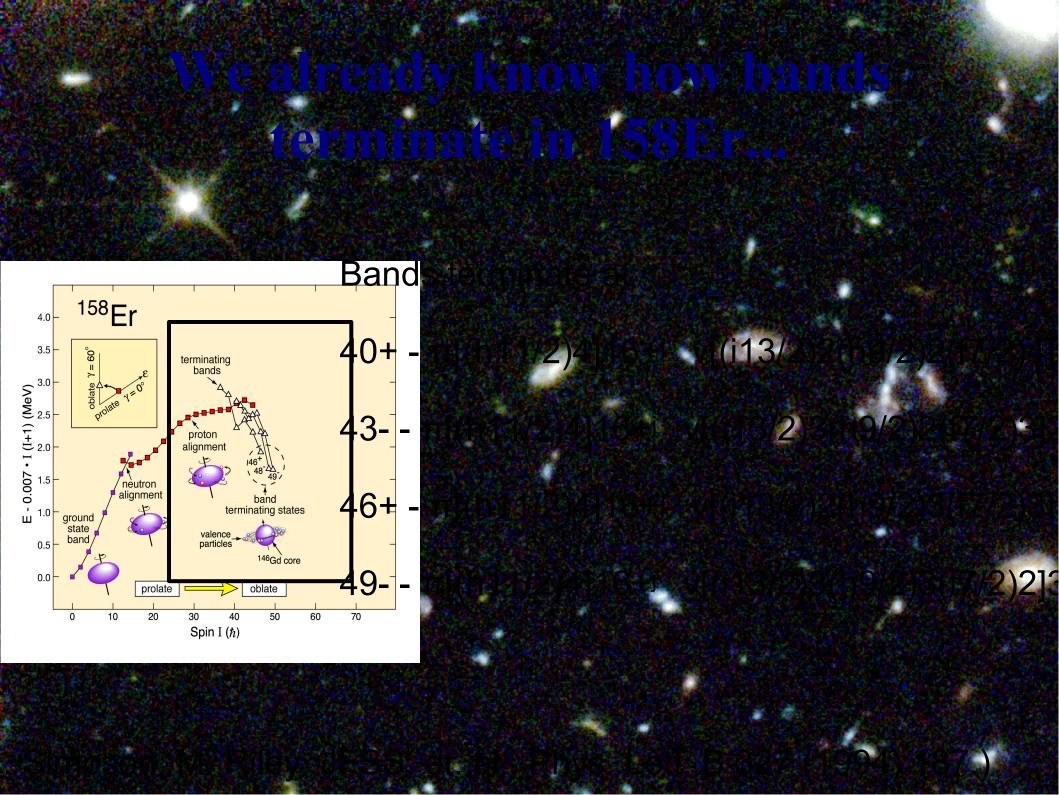


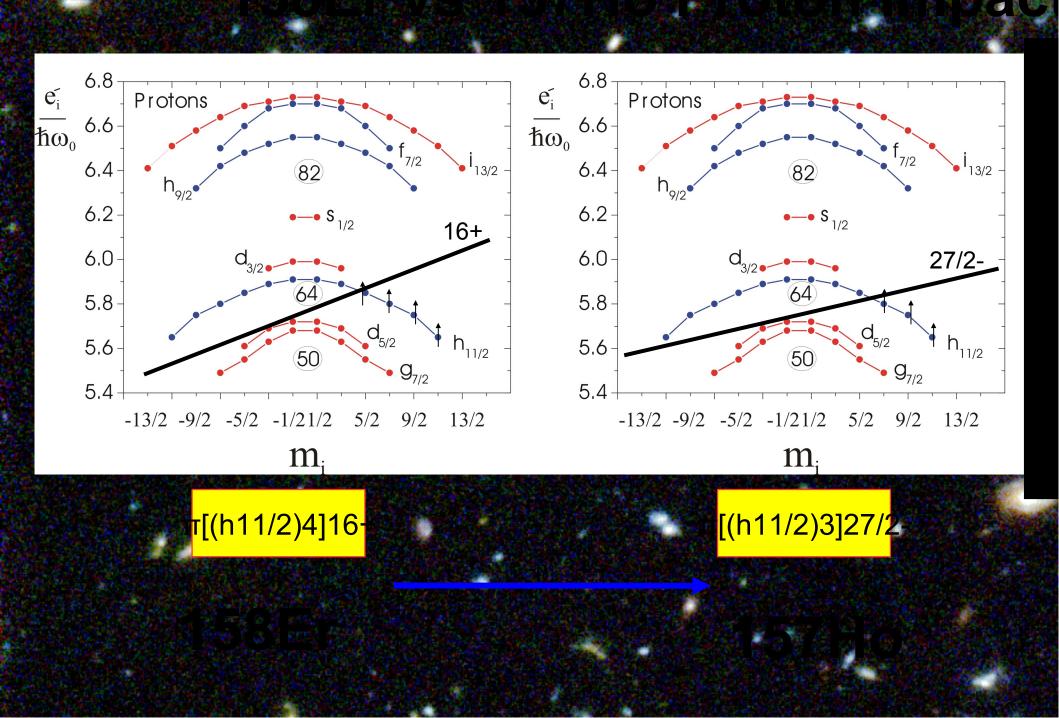


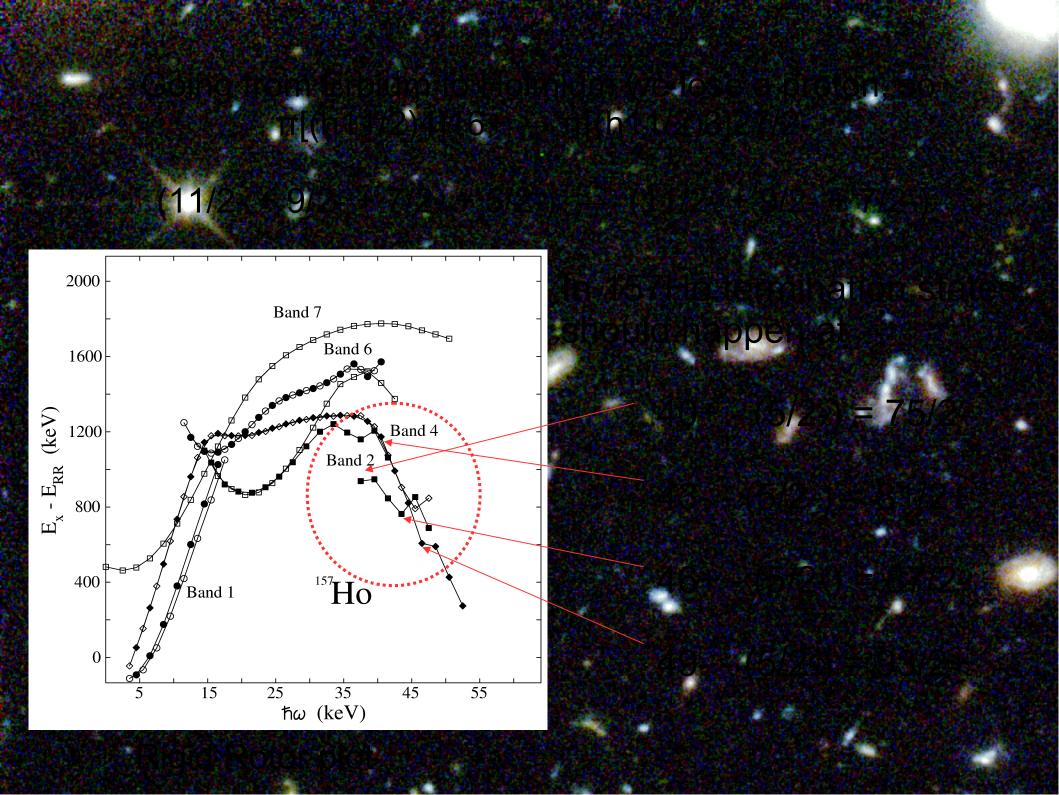


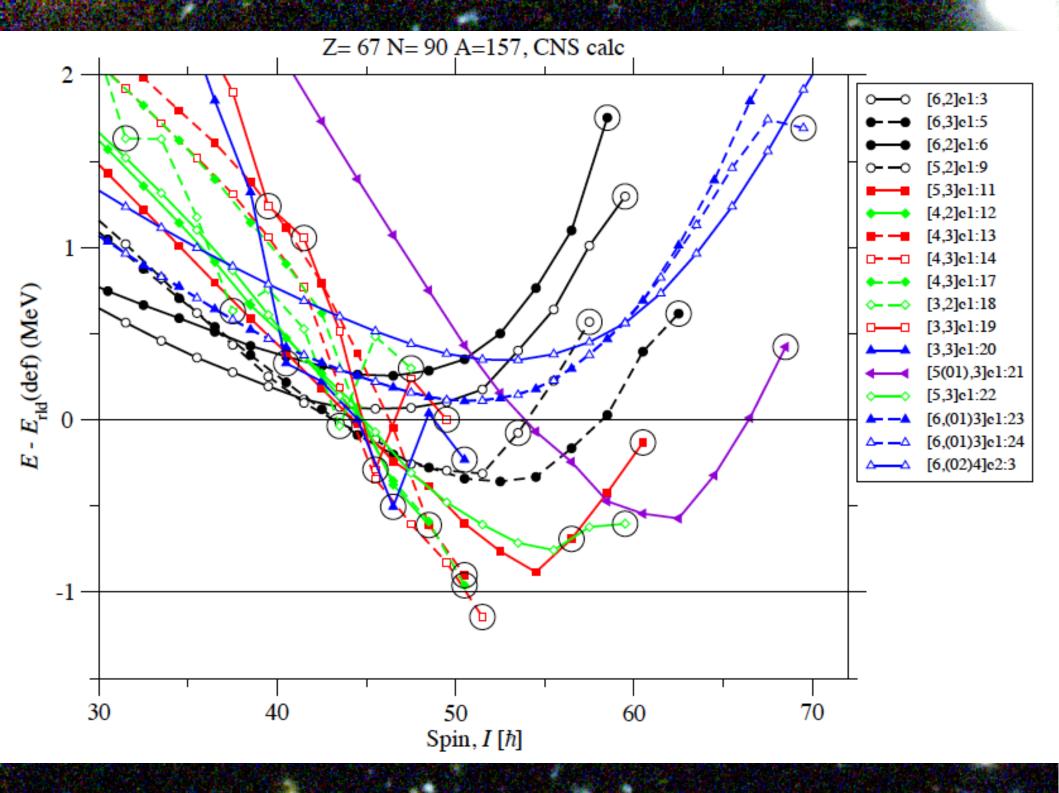


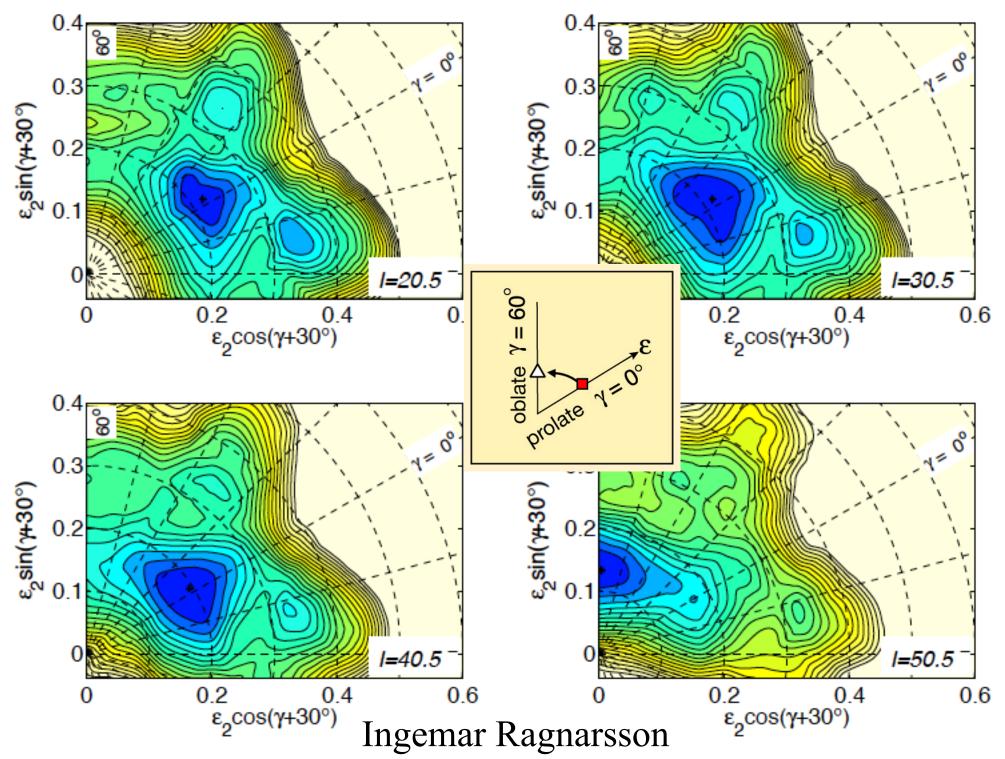


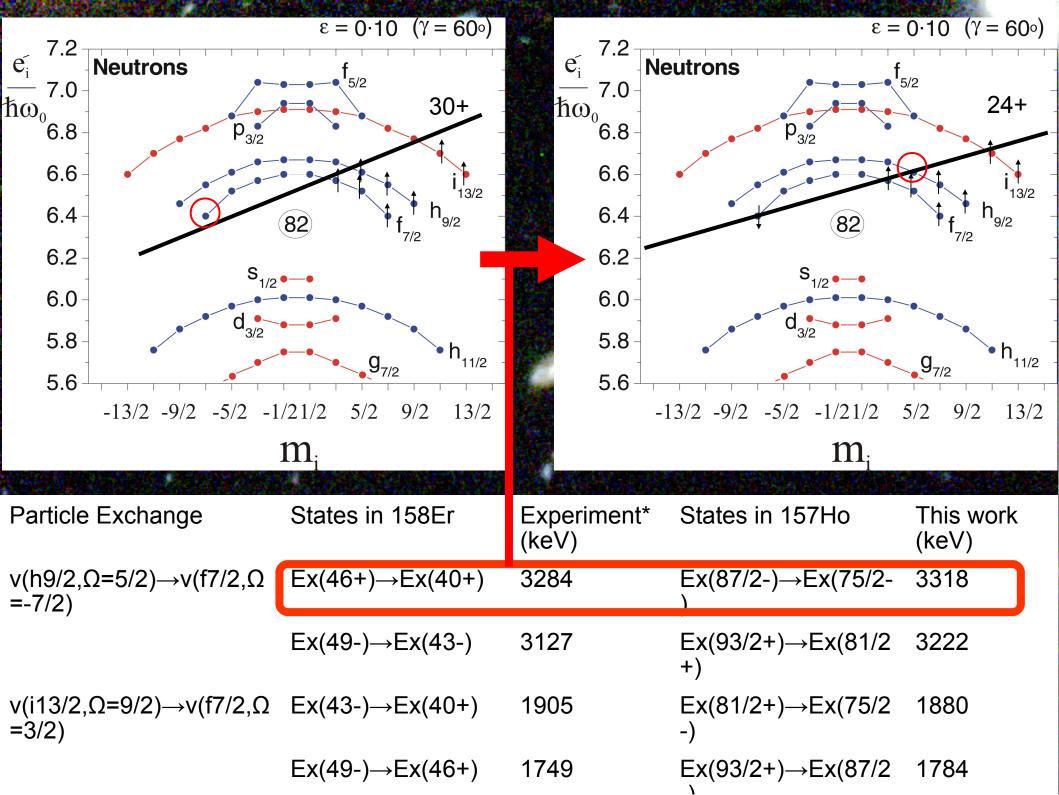


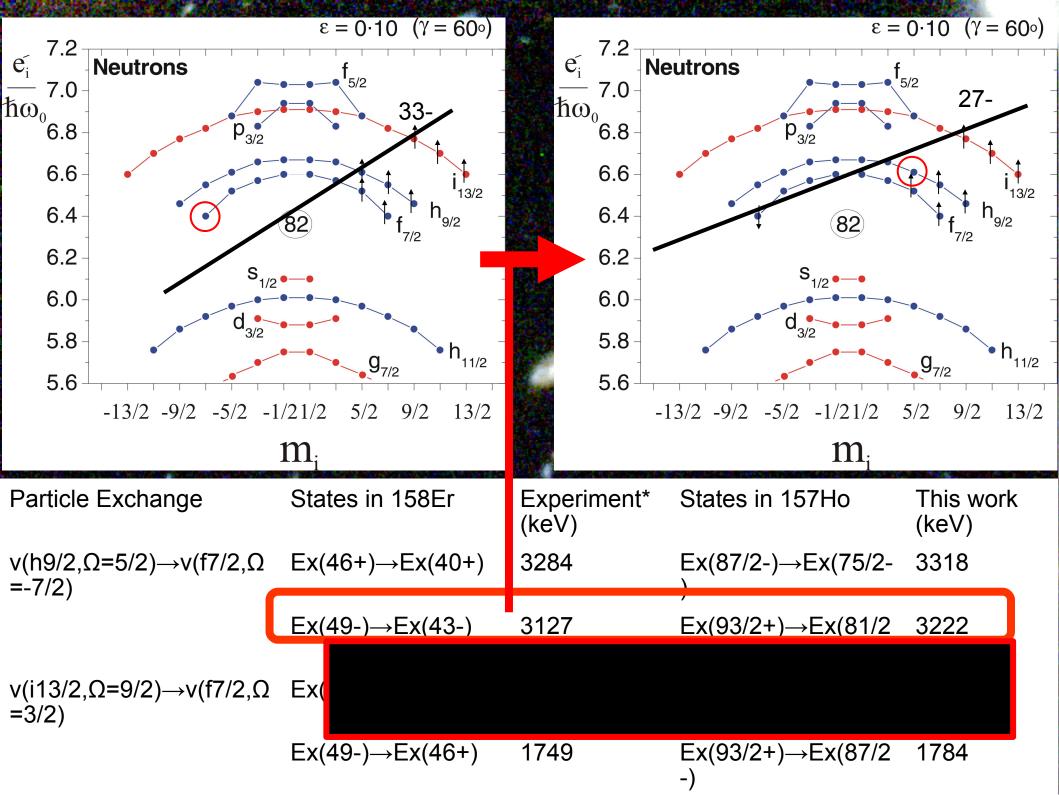


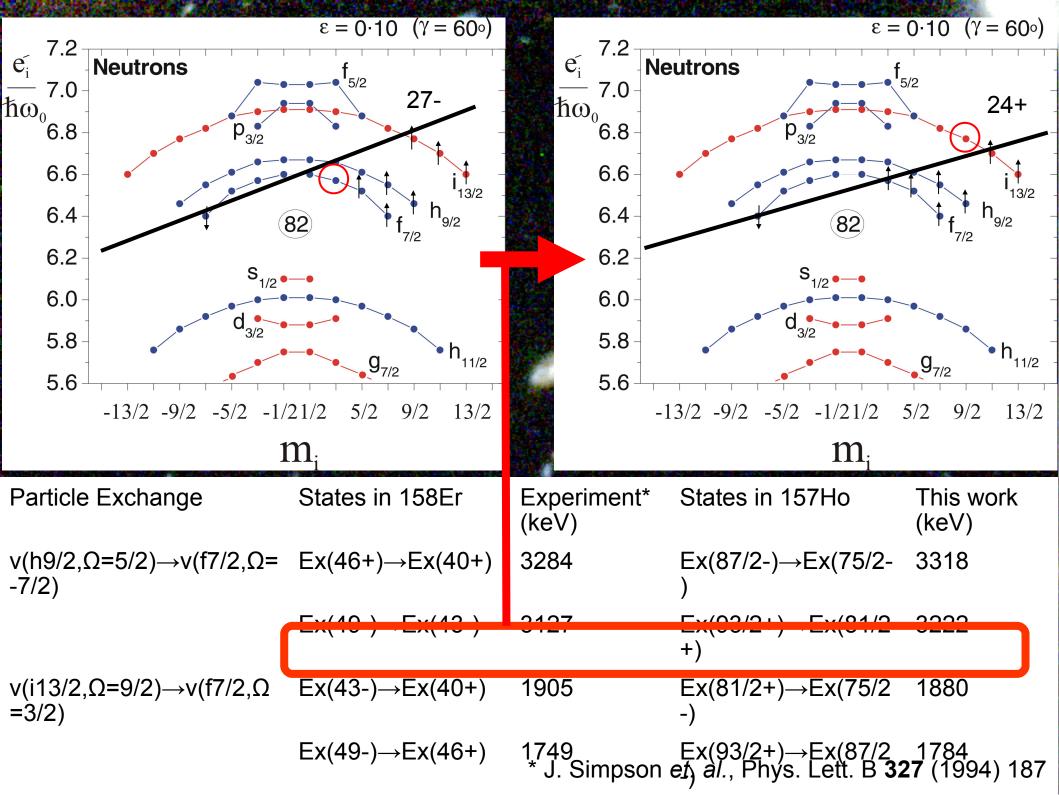


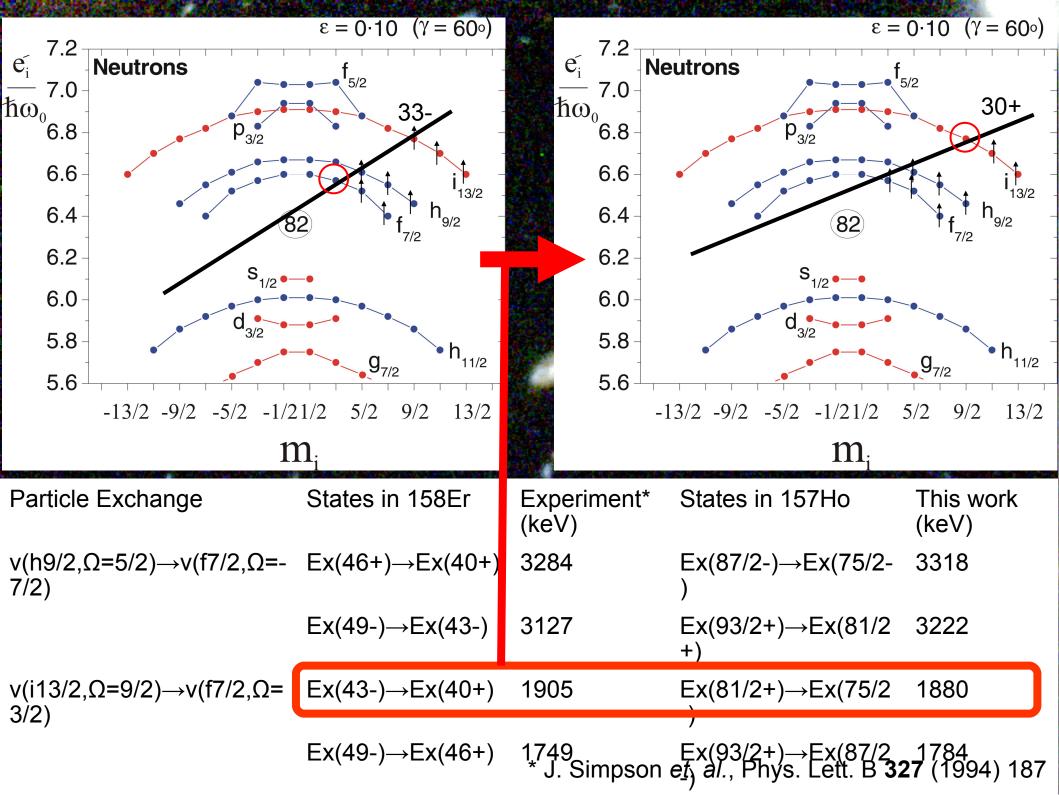


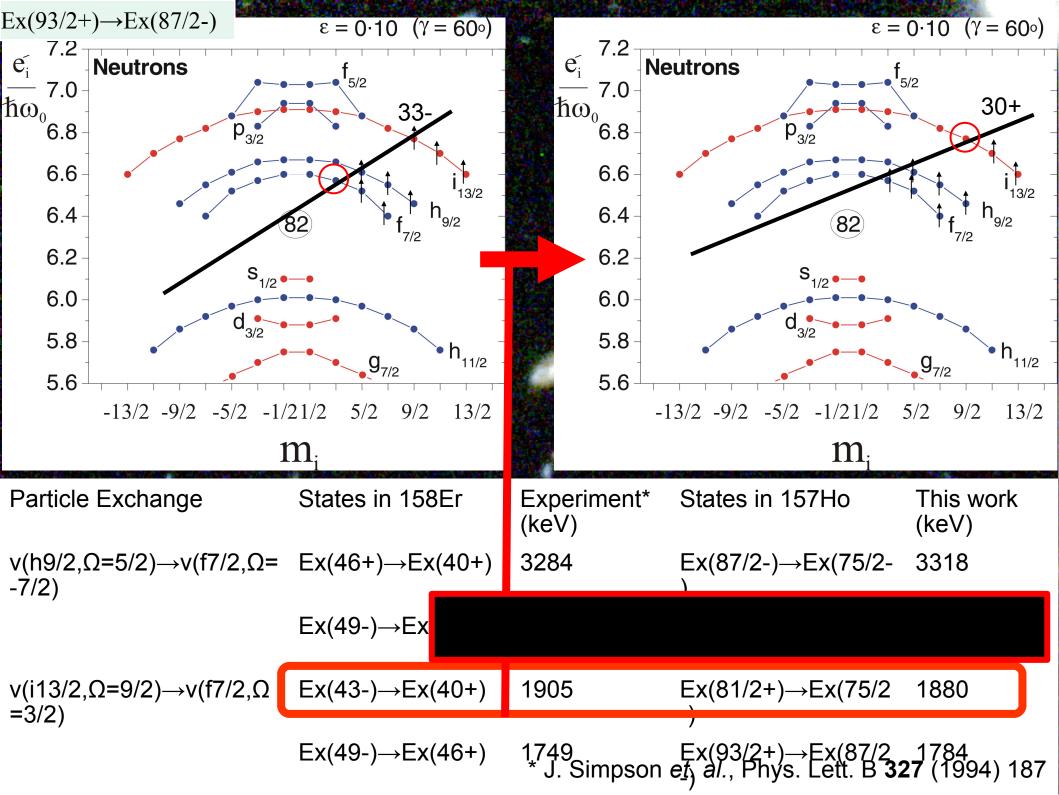




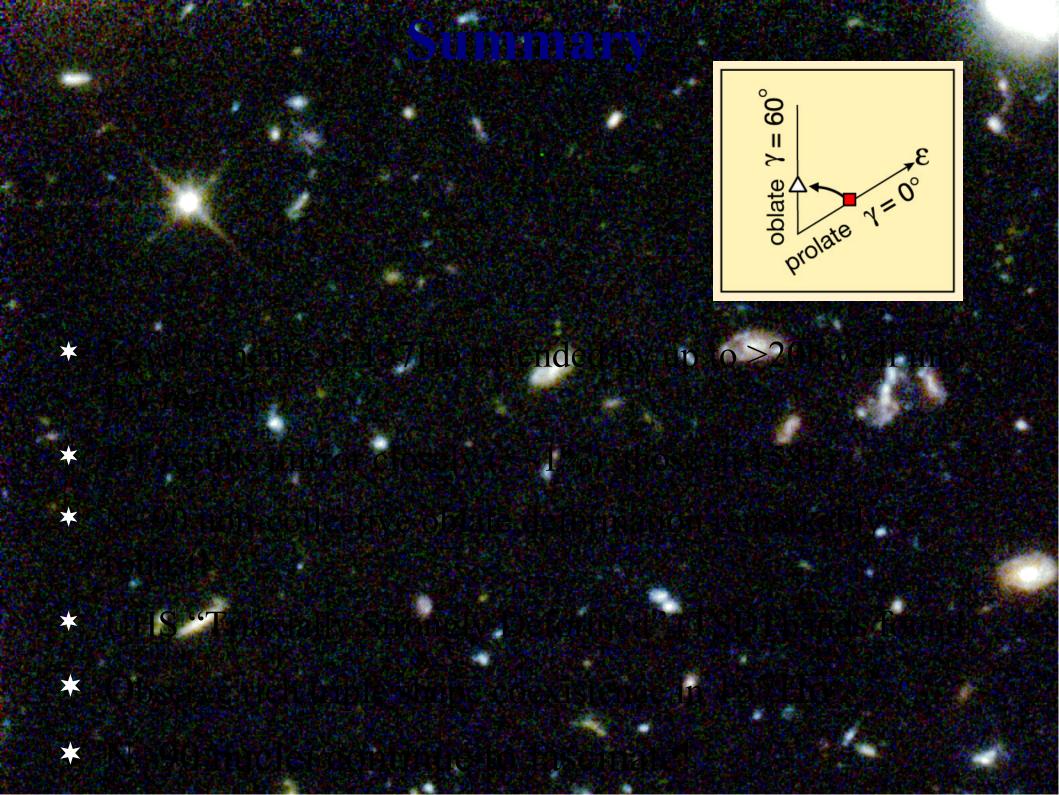








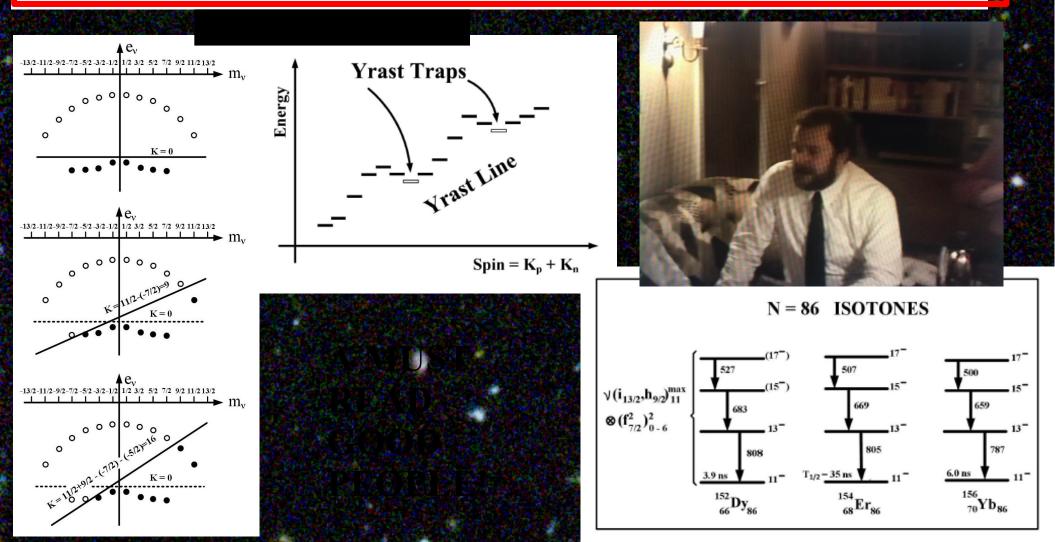






A historical overview of nuclear structure studies in Strasbourg Laboratories: Instrumentation, measurements and theory modelling - hand-in-hand Focus Issue on Nuclear Structure: Celebrating the 1975 Nobel Prize F A Beck

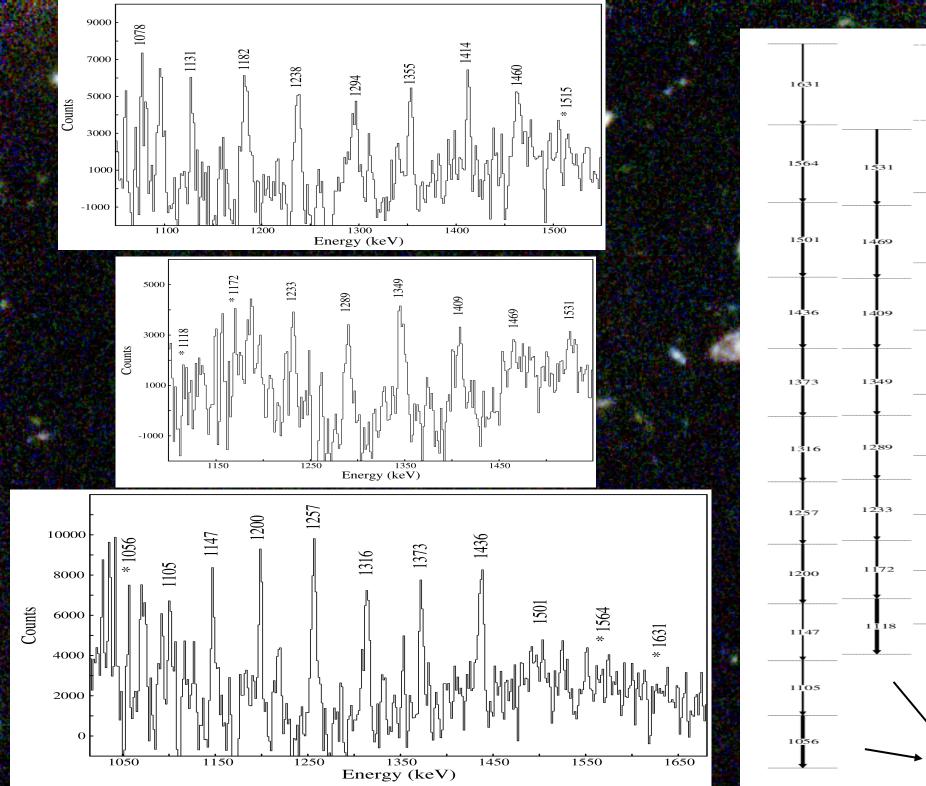
IPHC, Strasbourg, France



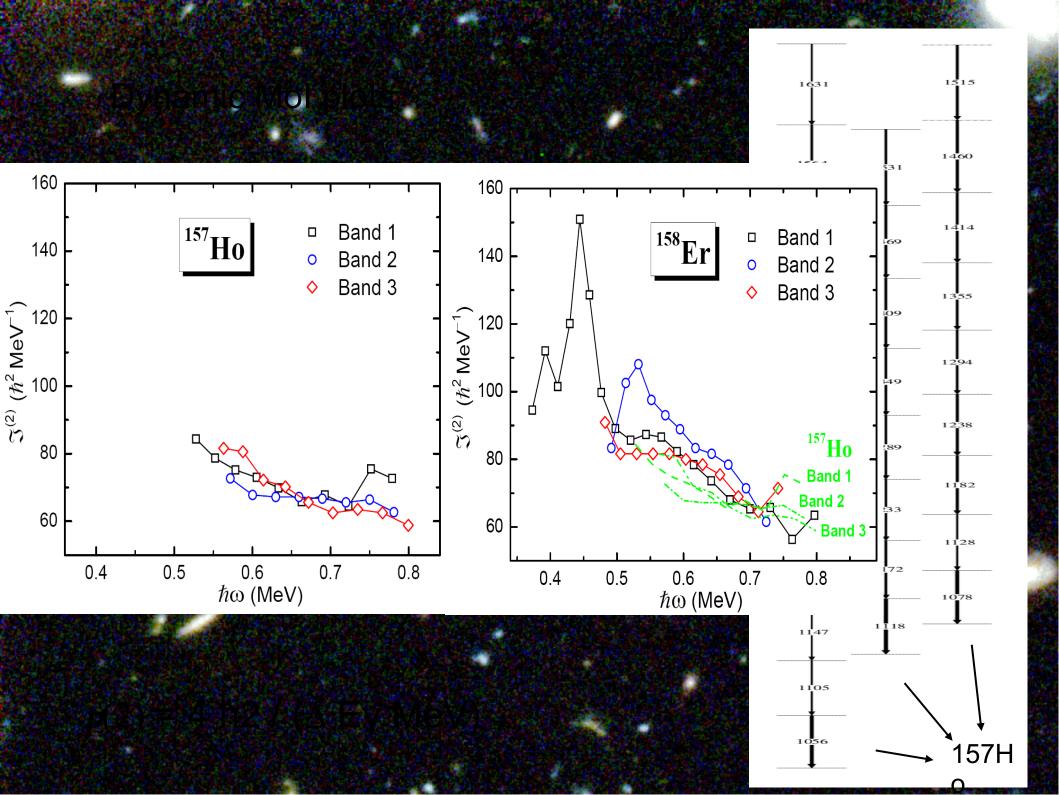


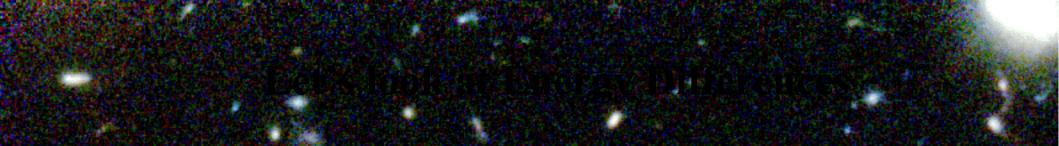




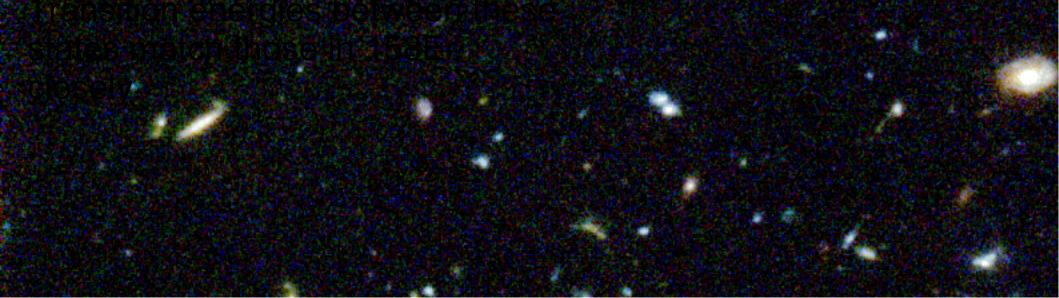


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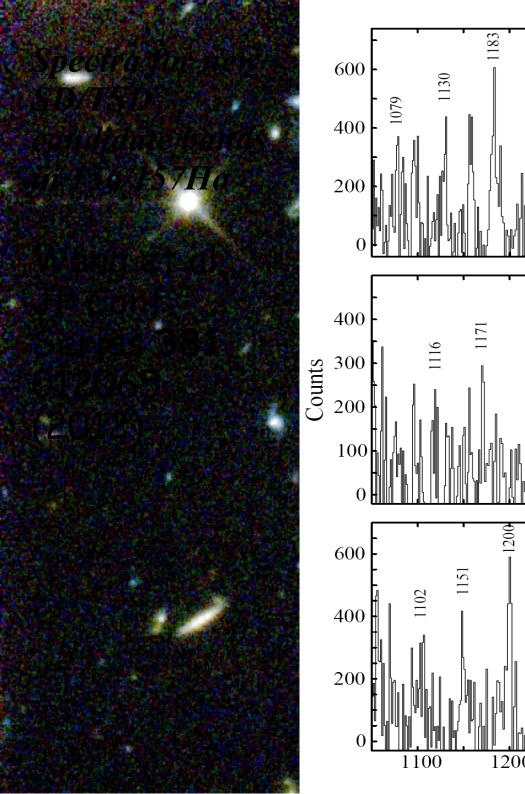


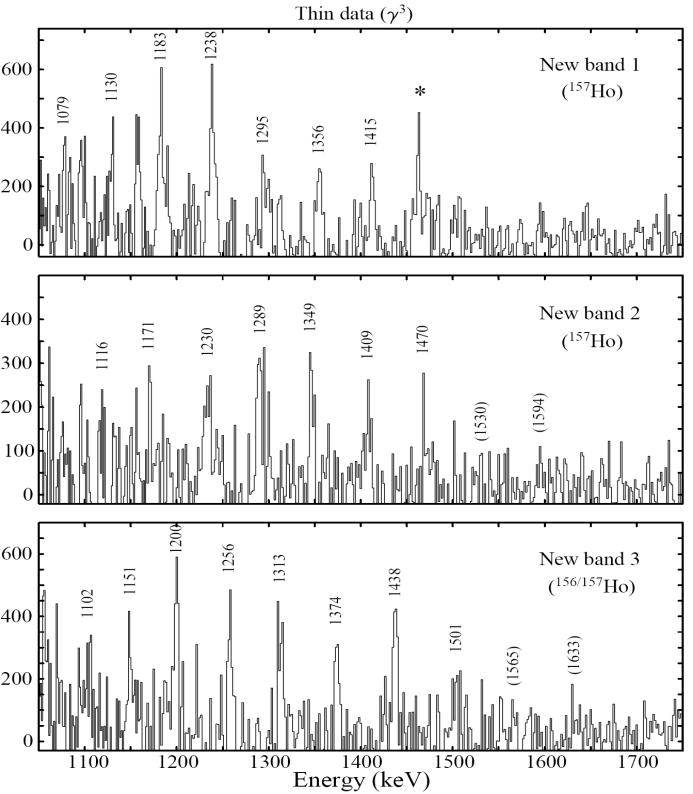


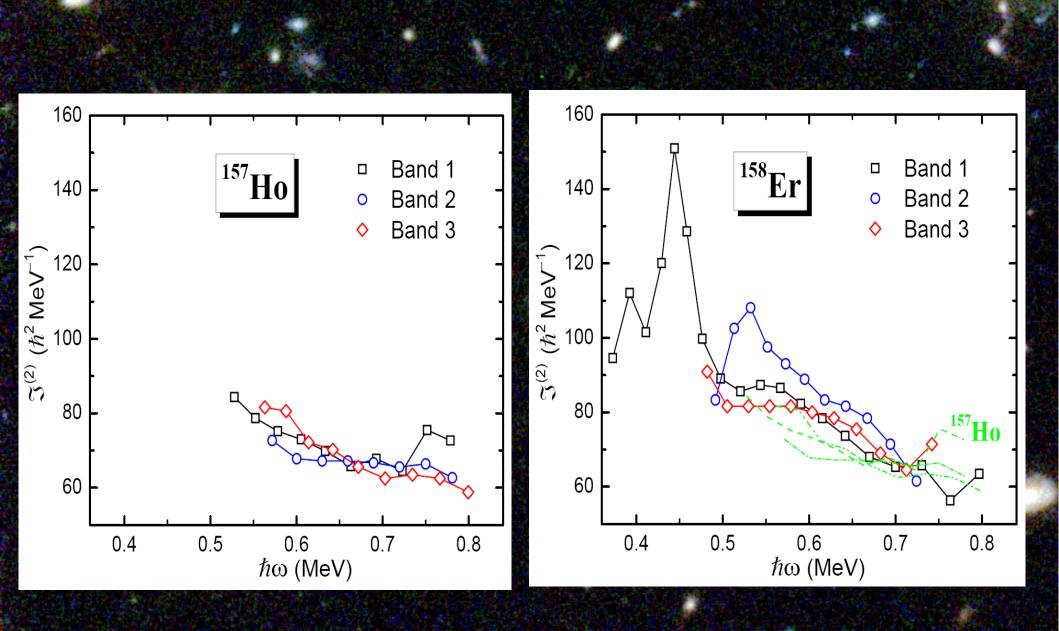
Particle Exchange	States in 158Er	Experiment	States in 157Ho	This work (keV)
		(keV)		
v(h9/2,Ω=5/2)→v(f7/2,Ω=- 7/2)	Ex(46+)→Ex(40 +)	3284	Ex(87/2-)→Ex(75/2-)	3318
	Ex(49-)→Ex(43-)	3127	Ex(93/2+)→Ex(81/2 +)	3222
v(i13/2,Ω=9/2)→v(f7/2,Ω=3/ 2)	Ex(43-)→Ex(40+)	1905	Ex(81/2+)→Ex(75/2 -)	1880
— 1/1	Ex(49-)→Ex(46+)	1749	Ex(93/2+)→Ex(87/2 -)	1784











High-spin Study of ¹⁶¹Lu: The Crossroads Between Lower Spin TSD Wobbling and Ultrahigh-Spin TSD Bands?
D.J. Hartley,¹ M.A. Riley,² J. Simpson,³ E. S. Paul,⁴ R. V. F. Janssens,⁵ L.L. Riedinger,⁶ A. D. Ayangeakaa,⁵ J. Baron,² M. Benner,¹ A. Boston,⁴, H. Boston,⁴ M.P. Carpenter, ⁵ C.J. Chiara,^{5,7} U. Garg,⁸ S. Hallgren,¹ J. Harker,5,7 F.G. Kondev,⁹ T. Lauritsen,⁵ W.C. Ma,¹⁰ P. Mason,³ J. Matta,⁸ S. Miller,² P. Nolan,⁴ J.R. Vanhoy¹, K. Villafana,² X. Wang,¹¹ J. Wright,⁴ and S. Zhu⁵

73	¹⁶² Ta	¹⁶³ Ta	¹⁶⁴ Ta	¹⁶⁵ Ta	¹⁶⁶ Ta	¹⁶⁷ Ta	¹⁶⁸ Ta	¹⁶⁹ Ta
72	¹⁶¹ Hf	¹⁶² Hf	¹⁶³ Hf	¹⁶⁴ Hf	¹⁶⁵ Hf	¹⁶⁶ Hf	¹⁶⁷ Hf	¹⁶⁸ Hf
71	¹⁶⁰ Lu	¹⁶¹ Lu ?	¹⁶² Lu	¹⁶³ Lu	¹⁶⁴ Lu	¹⁶⁵ Lu	¹⁶⁶ Lu	¹⁶⁷ Lu
70	¹⁵⁹ Yb	¹⁶⁰ Yb	¹⁶¹ Yb	¹⁶² Yb	¹⁶³ Yb	¹⁶⁴ Yb	¹⁶⁵ Yb	¹⁶⁶ Yb
69	¹⁵⁸ Tm	¹⁵⁹ Tm	¹⁶⁰ Tm	¹⁶¹ Tm	¹⁶² Tm	¹⁶³ Tm	¹⁶⁴ Tm	¹⁶⁵ Tm
68	¹⁵⁷ Er	¹⁵⁸ Er	¹⁵⁹ Er	¹⁶⁰ Er	¹⁶¹ Er	¹⁶² Er	¹⁶³ Er	¹⁶⁴ Er
67	¹⁵⁶ Ho	¹⁵⁷ Ho	¹⁵⁸ Ho	¹⁵⁹ Ho	¹⁶⁰ Ho	¹⁶¹ Ho	¹⁶² Ho	¹⁶³ Ho
ZN	89	90	91	92	93	94	95	96

Ultra high-spin TSD

TSD

High-spin Study of ¹⁶¹Lu: The Crossroads Between Lower Spin TSD Wobbling and Ultrahigh-Spin TSD Bands?
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73	¹⁶² Ta	¹⁶³ Ta	¹⁶⁴ Ta	¹⁶⁵ Ta	¹⁶⁶ Ta	¹⁶⁷ Ta	¹⁶⁸ Ta	¹⁶⁹ Ta
72	¹⁶¹ Hf	¹⁶² Hf	¹⁶³ Hf	¹⁶⁴ Hf	¹⁶⁵ Hf	¹⁶⁶ Hf	¹⁶⁷ Hf	¹⁶⁸ Hf
71	¹⁶⁰ Lu	¹⁶¹ Lu ?	¹⁶² Lu	¹⁶³ Lu	¹⁶⁴ Lu	¹⁶⁵ Lu	¹⁶⁶ Lu	¹⁶⁷ Lu
70	159 Vh	160 Vh	161 Vh	162 Vh	163Vh	164 Vh	165 Vh	166 Vh

To be continued at a later da

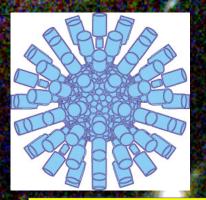
68	¹⁵⁷ Er	¹⁵⁸ Er	¹⁵⁹ Er	¹⁶⁰ Er	¹⁶¹ Er	¹⁶² Er	¹⁶³ Er	¹⁶⁴ Er
67	¹⁵⁶ Ho	¹⁵⁷ Ho	¹⁵⁸ Ho	¹⁵⁹ Ho	¹⁶⁰ Ho	¹⁶¹ Ho	¹⁶² Ho	¹⁶³ Ho
Z N	89	90	91	92	93	94	95	96

Ultra high-spin TSD

Wobbling

TSD





Outline of Talk



- •Search for Wobbling modes in A~170 Re and W nuclei.
- •Expts using Gammasphere at ANL.
- Detailed Spectroscopic Study 168,169,170,171W.
- Backbending in nuclei. A shameful advertisement. Many people in the room have participated in this great adventure!
- •Good for students to know some history. 🙂
- •Systematic Examination of Band Crossing Frequencies in the A≈170 Region. Continuing on from where Jerry Garrett left off.
- •The effect of seniority on pairing correlations from band crossing frequencies and comparisons to moment-of-inertia results from high-seniority high-K isomer studies.