



Lise Meitner Prize 2020 by the EPS - Laudatio for Piet Van Duppen (KU Leuven)

Björn Jonson
(Chalmers University, Gothenburg)



Piet Van Duppen
(KU Leuven)



Klaus Blaum
(MPIK Heidelberg)



*for their development and application of on-line instrumentation and techniques,
for their precise and systematic investigation of properties of nuclei far from stability,
and for shaping the scientific program at the online isotope separator facility ISOLDE, CERN*

Radioactive nuclides as probes for ...

Nuclear physics

Astrophysics



VOLUME 92, NUMBER 11

PHYSICAL REVIEW LETTERS

week ending
19 MARCH 2004

Unambiguous Identification of Three β -Decaying Isomers in ^{70}Cu

Atomic physics



PHYSICAL REVIEW C, VOLUME 61, 035801

β -decay half-life of ^{70}Kr : A bridge nuclide for the rp process beyond $A=70$

ARTICLE

Received 21 Aug 2012 | Accepted 27 Mar 2013 | Published 14 May 2013

DOI: 10.1038/ncomms2819

OPEN

Measurement of the first ionization potential of astatine by laser ionization spectroscopy

Accelerated radioactive beams from REX-ISOLDE

By: Kester, O.; Sieber, T.; Emhofer, S.; et al.
Group Author(s): ISOLDE Collaboration

The Miniball spectrometer

By: Warr, N.; Van de Walle, J.; Albers, M.; et al.
EUROPEAN PHYSICAL JOURNAL A Volume: 49

Hyperfine Interact (2017) 238: 28
DOI 10.1007/s10751-017-1406-x



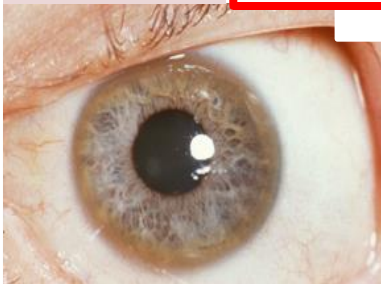
CrossMark

Storage ring at HIE-ISOLDE Technical design report

By: Grieser, M.; Litvinov, Yu. A.; Raabe, R.; et al.
EUROPEAN PHYSICAL JOURNAL-SPECIAL TOPICS Volume:

Material science

Laser resonance ionization spectroscopy on lutetium for the MEDICIS project



ARTICLE

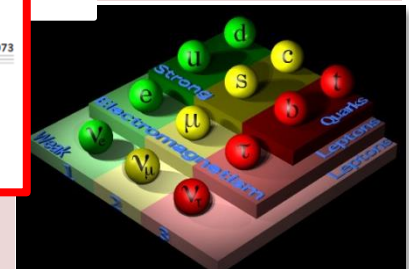
doi:10.1038/nature12073

Studies of pear-shaped nuclei using accelerated radioactive beams

Life sciences

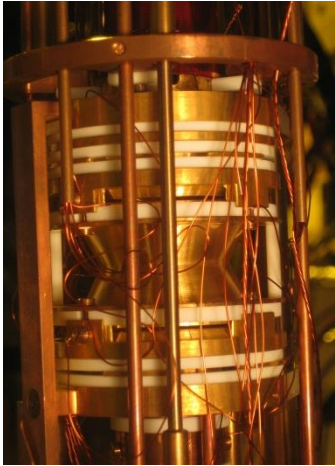
Test of the SM

Symmetries



Usage of on-line instrumentation

Penning traps for masses



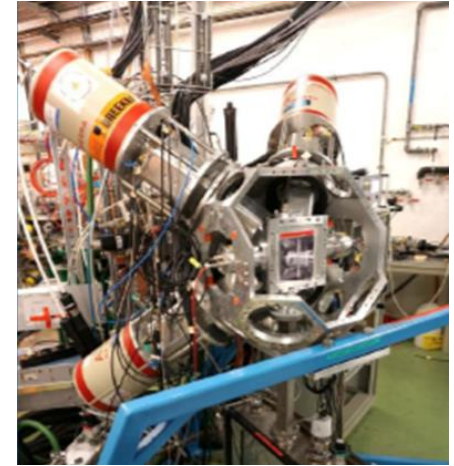
$$\omega_c = qB / m$$

Lasers for radii and moments



$$\delta\nu_{\text{IS}}^{AA'} \propto \Delta |\Psi(0)|^2 \delta \langle r^2 \rangle^{AA'}$$

Detectors for decays / life times



$$N(t) = N_0 e^{-t/\tau}$$

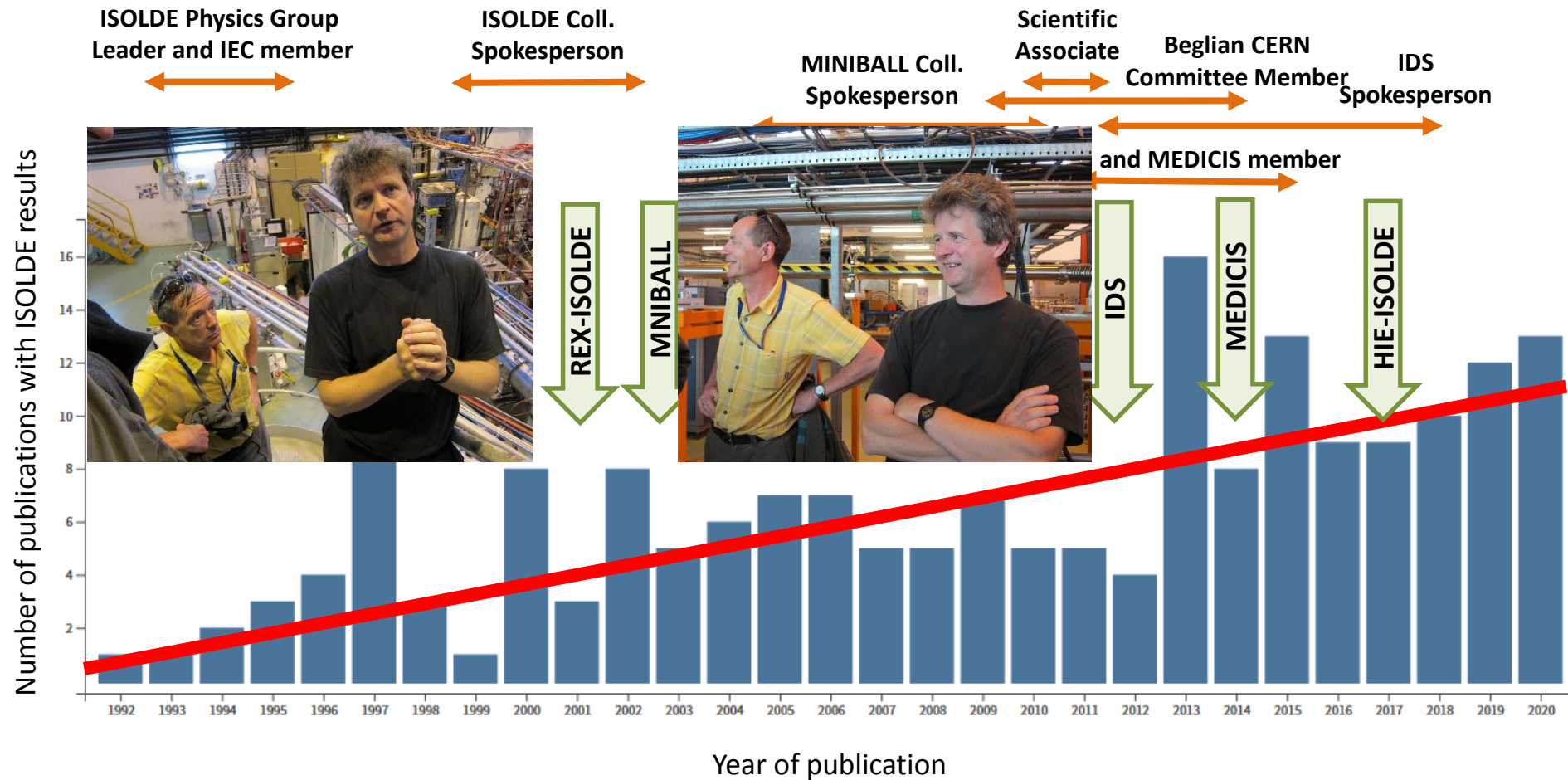
Post-acceleration for shapes



$$R = \frac{B(E2, 2_i^+ \rightarrow I_1^+)}{B(E2, 2_i^+ \rightarrow 0_1^+)}$$

Shaping the scientific program of ISOLDE

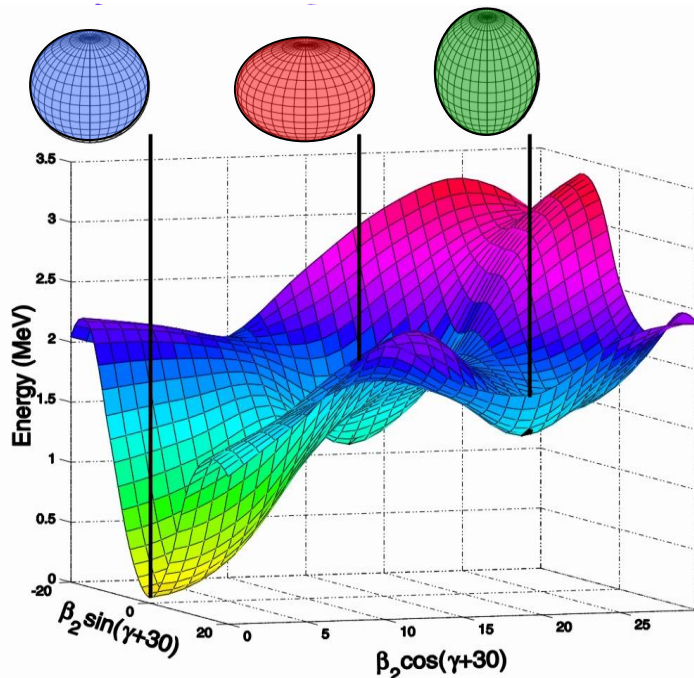
Piet did an amazing service to the ISOLDE community!



Piet published so far 451 scientific peer-reviewed articles, among them >200 with results from ISOLDE

Shape coexistence in Pb-186

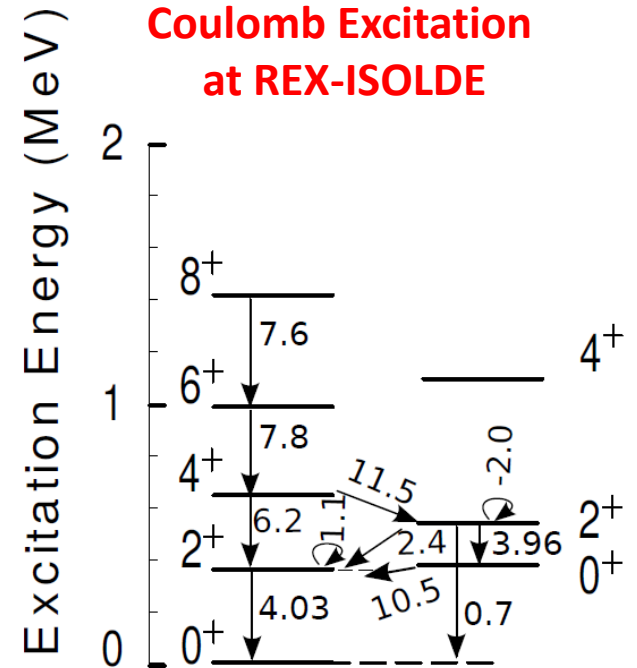
- states with different shapes at similar binding energy
- the result of the interplay between two opposing tendencies:
 - stabilizing effect of closed (sub)shells
 - residual p-n interaction: correlation energy



Potential energy surface for ^{186}Pb



Coulomb Excitation at REX-ISOLDE



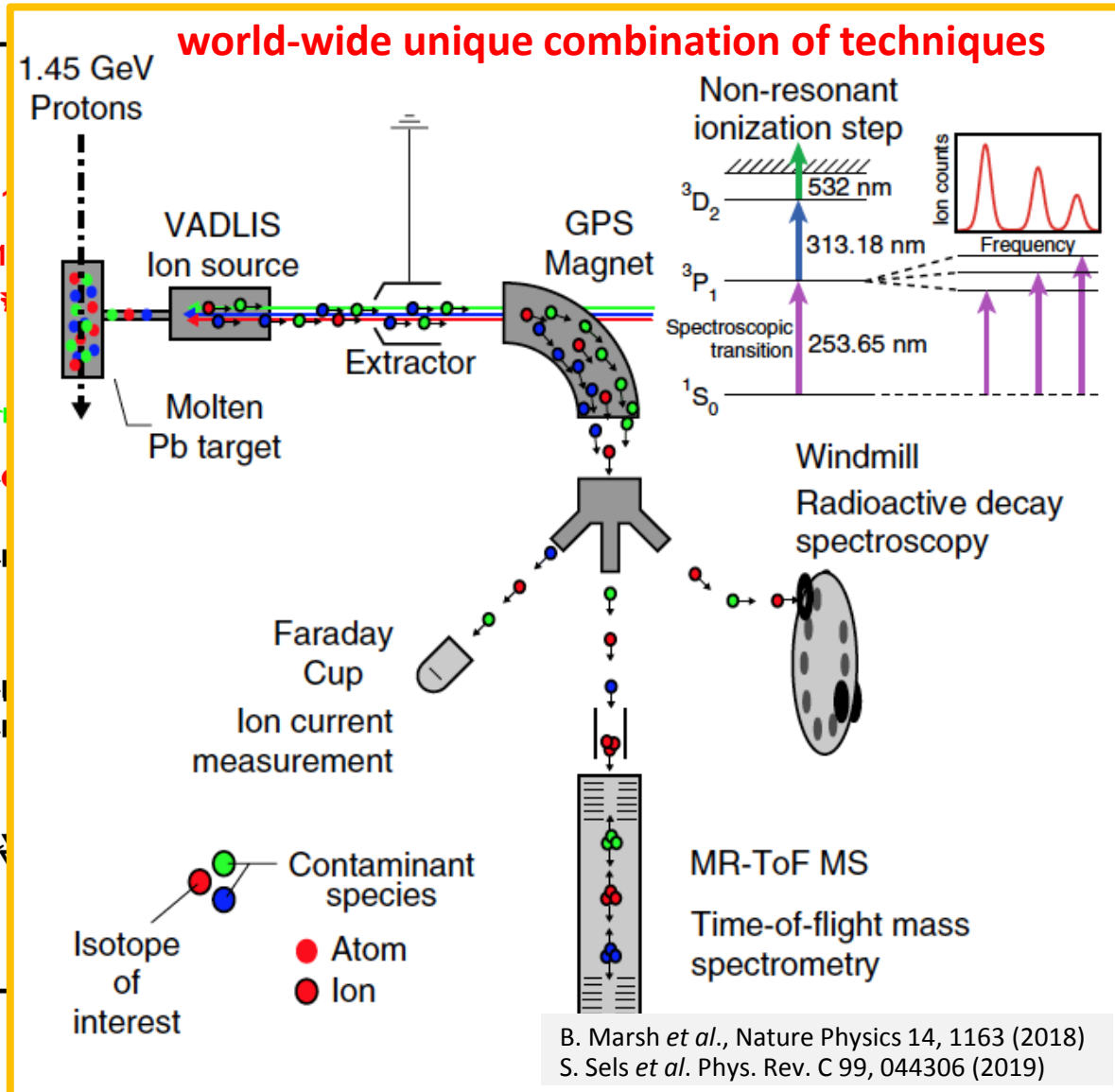
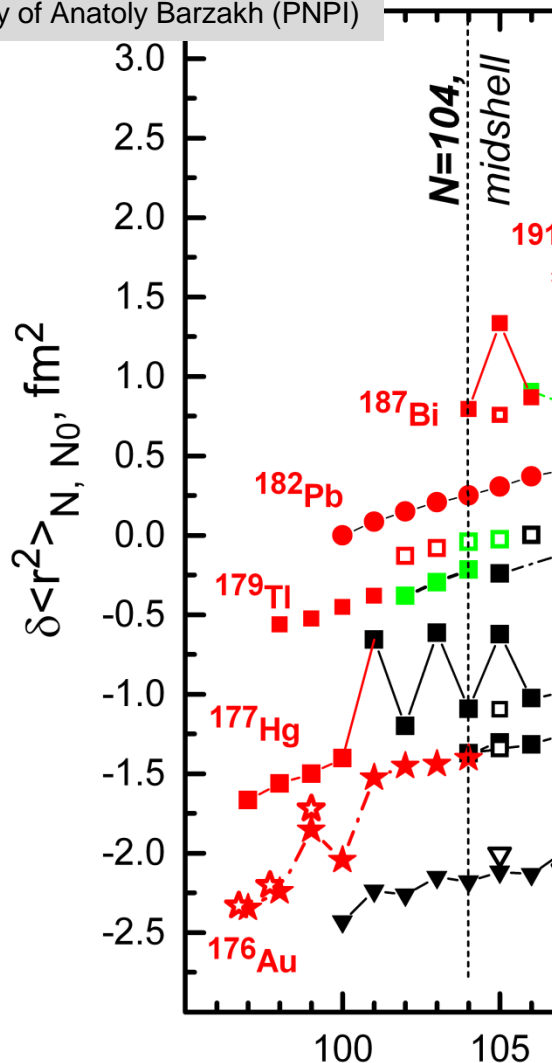
^{184}Hg

A. Andreyev et al., Nature 405 (2000) 430

- ❖ Nuclear structure studies
- ❖ Tests of nuclear models

Precise laser studies of radionuclides

Courtesy of Anatoly Barzakh (PNPI)



Personal remarks - *Congratulations*

Piet (often with Mark Huyse) has done for decades **pioneering work** in nuclear physics research at ISOLDE.

- He has developed **unique tools** and measurement techniques.
- He has followed **new**, so far **unexplored paths**.
- He has done **major discoveries** and experimental breakthroughs.

The Lise Meitner Prize 2020 is well-deserved for Piet and I feel proud to share the award with him and Björn.

Thanks to ...

the COLLAPS and ...

... ISOLTRAP Teams!

