# (Quick) Summary of the Stopped Beam Rising Physics Workshop

29-30th March 2004

University of Surrey,

Guildford, UK

see the web at

http://www.ph.surrey.ac.uk/~phs1pr/rising/stopped_workshop_mar04

# Possible Physics Aims

- Isomer Experiments
  - Shape coexistence in neutron deficient Z>82
  - Single particle states around $^{132}$Sn ?
  - Seniority isomers around $^{78}$Ni ?
  - K-isomers in 180 and N=74?
  - Neutron rich, Z~82 spectroscopy ?
- Other (related) work
  - G-factor measurements
  - fast timing using $BaF_2$
- DSSD work ?
  - Beta-delayed gamma-ray spectroscopy
  - Proton emitters
  - alpha fine structure

# Experimental Equipment?

- Detectors
  - RISING CLUSTERs
  - BaF2 for fast timing
  - active stopper(s)?
    - **Si only ?**
    - **CdZnTe ?**
    - **Active degraders ?**
    - **Flash problem ?**
  - Dedicated electronics
  - TDR ?
  - Free running clock ?

➢50 delegates, ~ 20 presentations, 4 working groups…..

**Stopped Beam Physics Workshop, Guildford 29-30th March 2004**




+ lots of evening discussions at the Bombay Spice !

# DISCUSSION GROUPS

- Heavy, neutron-rich A~170-220 (K-isomers, trans-Bi isomers) *Zsolt Podolyak*

- Fission frags (A~132 r-process, $^{110}$Mo X(5), $^{120}$Pd E(5), oblate isomers, N=74..) *Alison Bruce*

- N=Z, mirror symmetry, $^{54}$Ni, $^{82}$Nb, $^{86}$Tc isomers, $^{100}$Sn beta-decay *Thomas Faestermann*

- Heavy, proton-rich nuclei, Os-Po shape coex., fine structure in alpha/proton decays ...etc *Robert Page*

# Holdovers from the Isomer Campaign (EA June 29 2000!)

**Experiments related to fast campaign**

- $^{132}$Te Coulex (Schlegel/Gerl 18 shifts)
- $^{32}$Mg Coulex via 2-step fragmentation (Gerl 21 shifts)

**Stopped Experiments from Campaign still to run**.

- Effective charges around $^{56}$Ni (Rudolph, 12 shifts)
- Isomer spec. around $^{78}$Ni with fission frags. (Grawe 21 shifts)
- Isomer spec. of odd-odd $T_z$=0 $^{82}$Nb and $^{86}$Tc (Regan 15 shifts)

**Experiments which have already run**

- Shell structure around $^{132}$Sn (Mineva et al., 12 shifts)
- Isomer spect. and shape coex. of Pb isotopes (Page 15shifts)
- Shape coex. in Neutron-Rich Po,Th Nuclei (Podolyak 15 shifts)

# ‘New’ Proposals Discussed at Workshop

**1. $^{100}$Sn beta decay, Faestermann, Woods, Pfutzner et al.,**

**2) $^{103}$Sb, $^{104}$Te, $^{108}$Xe, rp-process end points, Woods, Faestermann et al.,**

**3) $^{96,8}$Cd beta-decaying isomers, Gorska, Grawe, Fahlander et al.,**

**4) $^{68}$Se and $^{80}$Zr shape coex. Becker, Wadsworth et al.,**

**5) $^{71}$Kr beta-decay; Rubio, Algora, Gelletly, et al.,**

**6) $^{130}$Cd musec isomers and beta-decays, Gorska, Pfutzner, Regan et al.,**

**7) $^{106,8}$Zr tetrahedral searches (beta-decay following fission) and**

**8) A~110-120 Zr-Pd X(5) searches, Clark, Bruce, Mach, Krucken et al.,**

**9) A~130 proton drip-line searches, N=74, Cullen, Scholey, Bruce, et al.,**

**10) N~126 neut.-rich Os-Pt, Podolyak, Page, Joile, Warr, Benlliure,…**

**11) $^{212}$Pb isomers, Pfutzner, Karny et al.,**

**12) $^{170}$Dy, valence max. SU(3), Regan, Walker, Podolyak, Benlliure,…**

**13) GDR on high-spin isomers, fission effects, Maj, Bracco Walker et al.**

## Stoppers

1) Passive plastic stopper (high rate, isomer only expts.)

2) Large area, medium segmentation for beta-delayed

   spectroscopy (~ 15cm x 5 cm) for beta-delayed spectrocopy of fission frags., $^{170}$Dy, N=126 etc. (Grant application by Surrey, Liverpool, CLRC-Daresbury)

3) Smaller area, high segmentation (e.g. $^{100}$Sn) Munich et al.,

4) Fast recovery (alpha/proton decays?) Edinburgh ?

## Ancillary Detectors

1) $BaF_2$ fast timing for many of the above experiments, Mach, Regan, Cullen

2) g-factors, $\mu$-moments, Mallion, Neyens, Hass, Taylor....

3) HECTOR detectors. Maj, Bracco, Camera et al.,