

# *Nuclear Astrophysics WS, Basel 2014*

## *“Most recent Penning-trap and storage ring mass data for nuclear-astrophysics studies”*

- CSRe data (Lanzhou)
- ISOLTRAP data (ISOLDE/CERN)



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**Sep 29<sup>th</sup>, 2014**

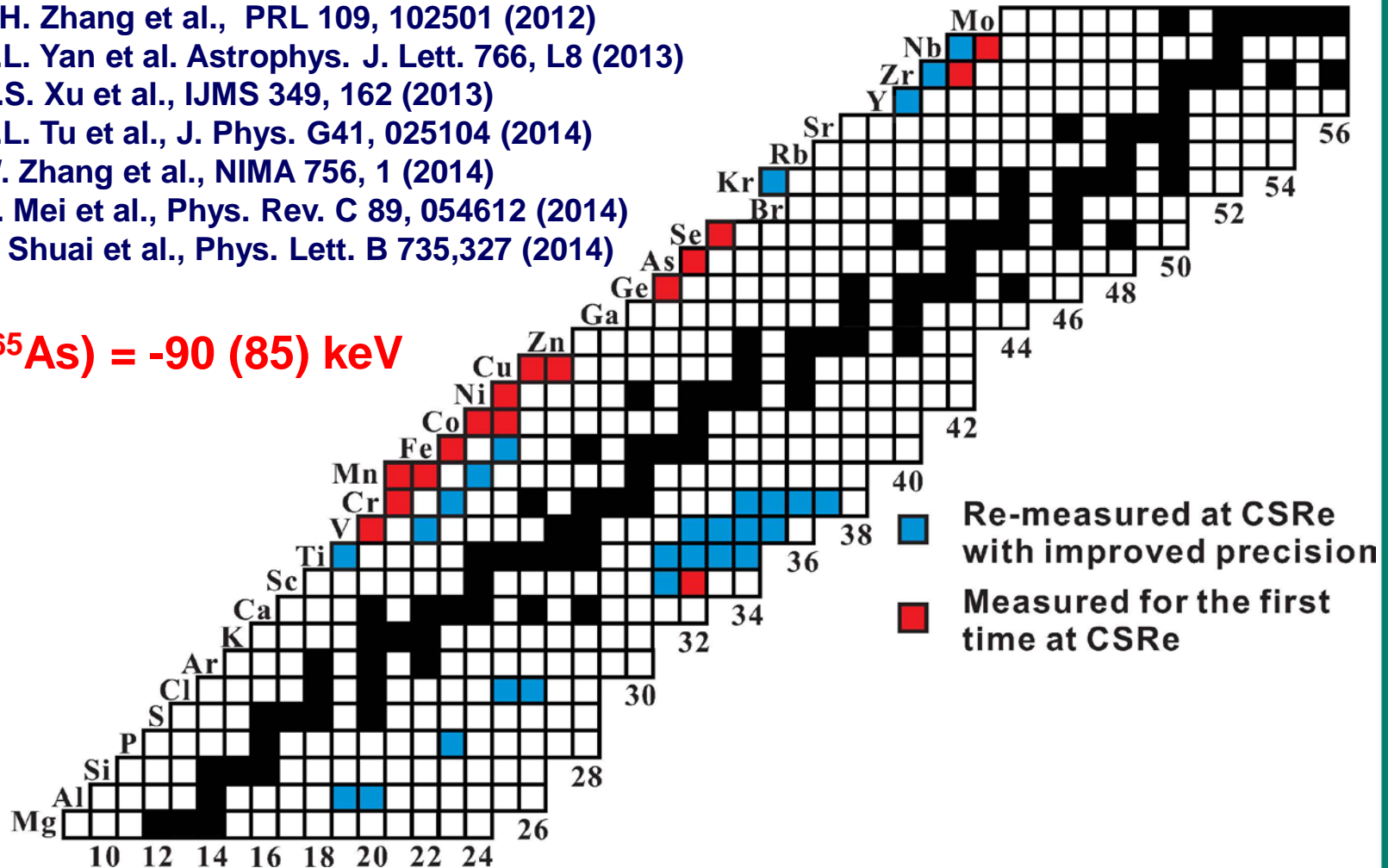


# CSRe storage ring data

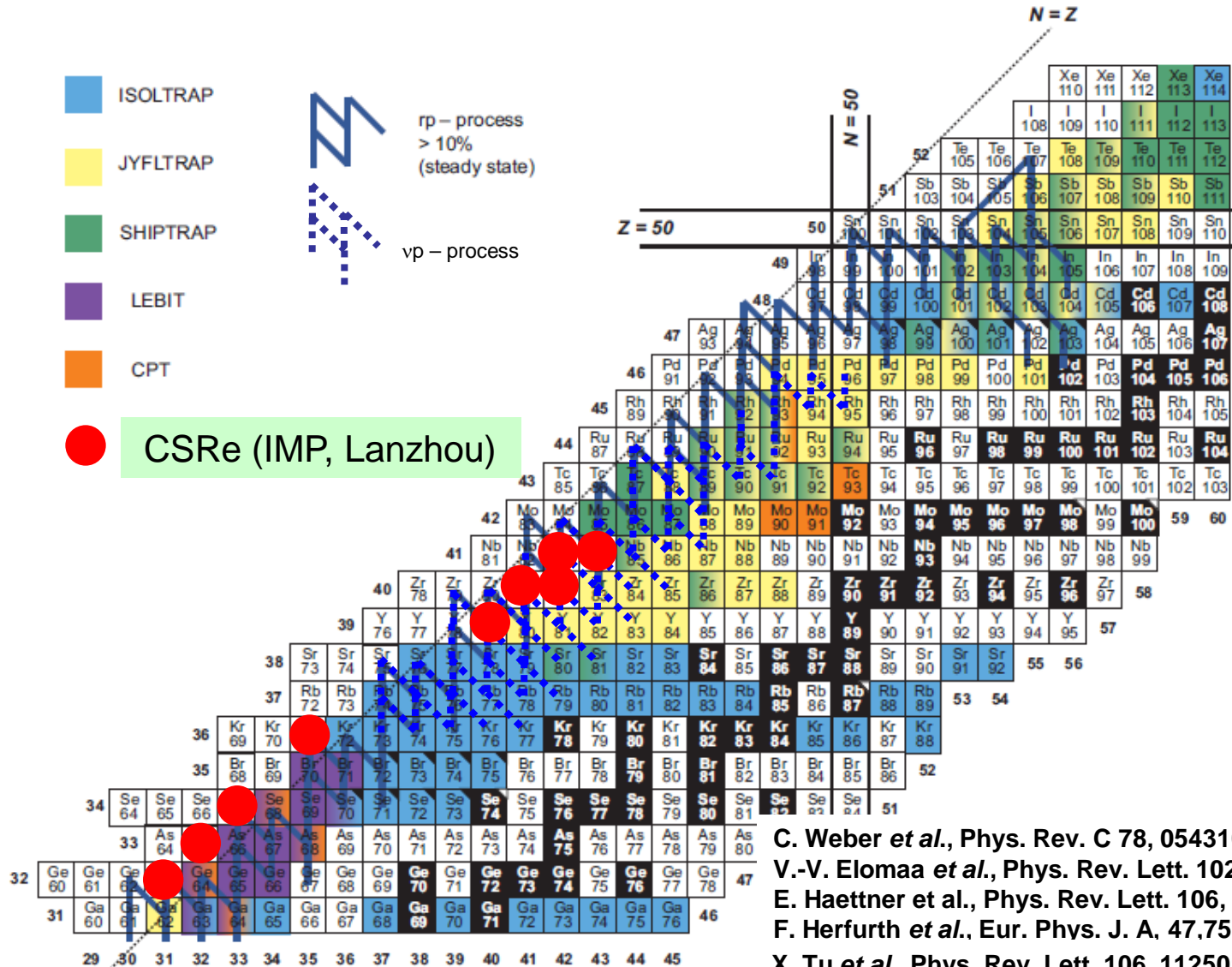
1. B. Mei et al., NIMA A 624, 109 (2010)
2. X.L. Tu et al., PRL 106, 112501 (2011)
3. X.L. Tu et al., NIMA A 654, 213 (2011)
4. Y.H. Zhang et al., PRL 109, 102501 (2012)
5. X.L. Yan et al. Astrophys. J. Lett. 766, L8 (2013)
6. H.S. Xu et al., IJMS 349, 162 (2013)
7. X.L. Tu et al., J. Phys. G41, 025104 (2014)
8. W. Zhang et al., NIMA 756, 1 (2014)
9. B. Mei et al., Phys. Rev. C 89, 054612 (2014)
10. P. Shuai et al., Phys. Lett. B 735,327 (2014)

Beams:  $^{56}\text{Ni}$ ,  $^{78}\text{Kr}$ ,  $^{86}\text{Kr}$ ,  $^{112}\text{Sn}$

$$S_p(^{65}\text{As}) = -90 (85) \text{ keV}$$



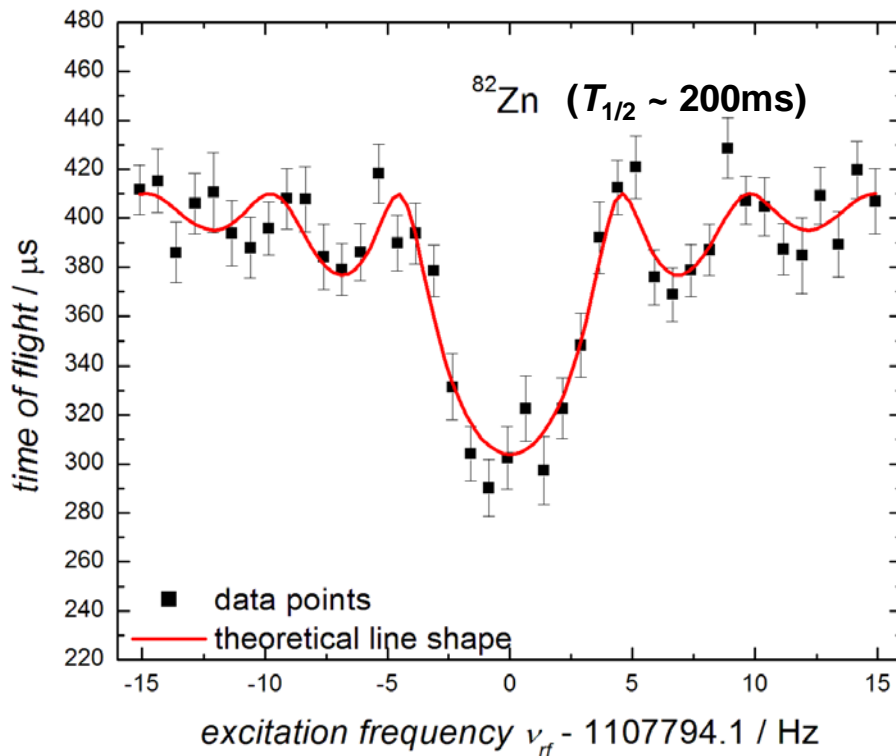
# Nuclides at the rp-process path



C. Weber *et al.*, Phys. Rev. C 78, 054310 (2008)  
 V.-V. Elomaa *et al.*, Phys. Rev. Lett. 102, 252501 (2009)  
 E. Haettner *et al.*, Phys. Rev. Lett. 106, 122501 (2011)  
 F. Herfurth *et al.*, Eur. Phys. J. A, 47,75 (2011)  
 X. Tu *et al.*, Phys. Rev. Lett. 106, 112501 (2011)

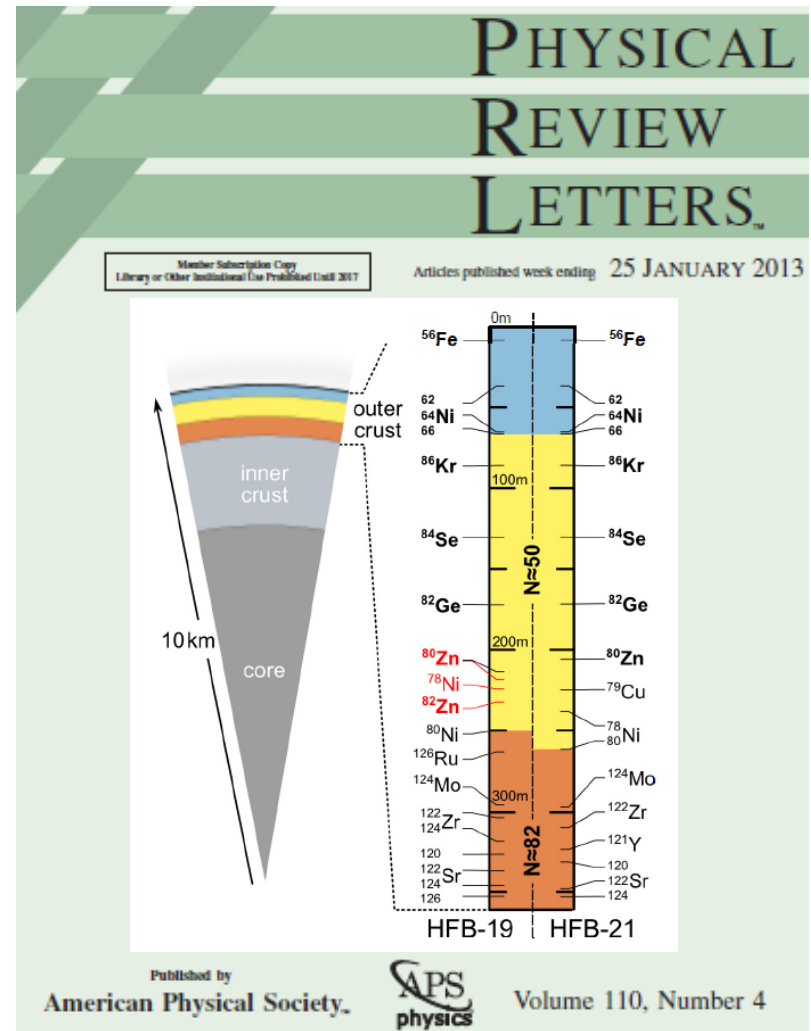
# ISOLTRAP: Nuclear astrophysics

## Composition of the outer crust of a neutron star



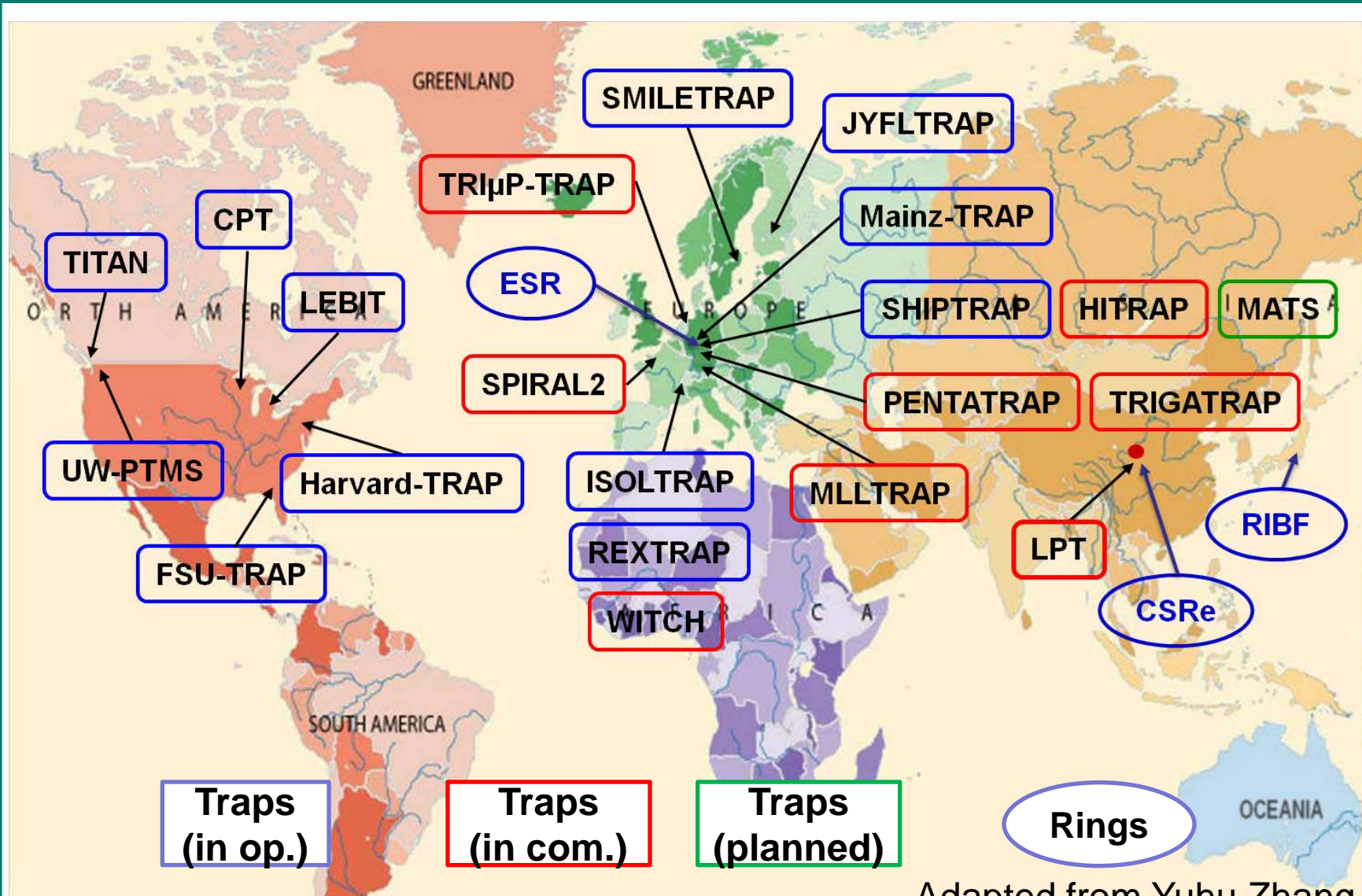
$$\delta m/m \sim 10^{-8} (< 1 \text{ keV})$$

R. Wolf *et al.*, Phys. Rev. Lett., 110, 041101 (2013)





# Mass measurement facilities worldwide



Adapted from Yuhu Zhang