

Kern- und Teilchenphysik

SS2012

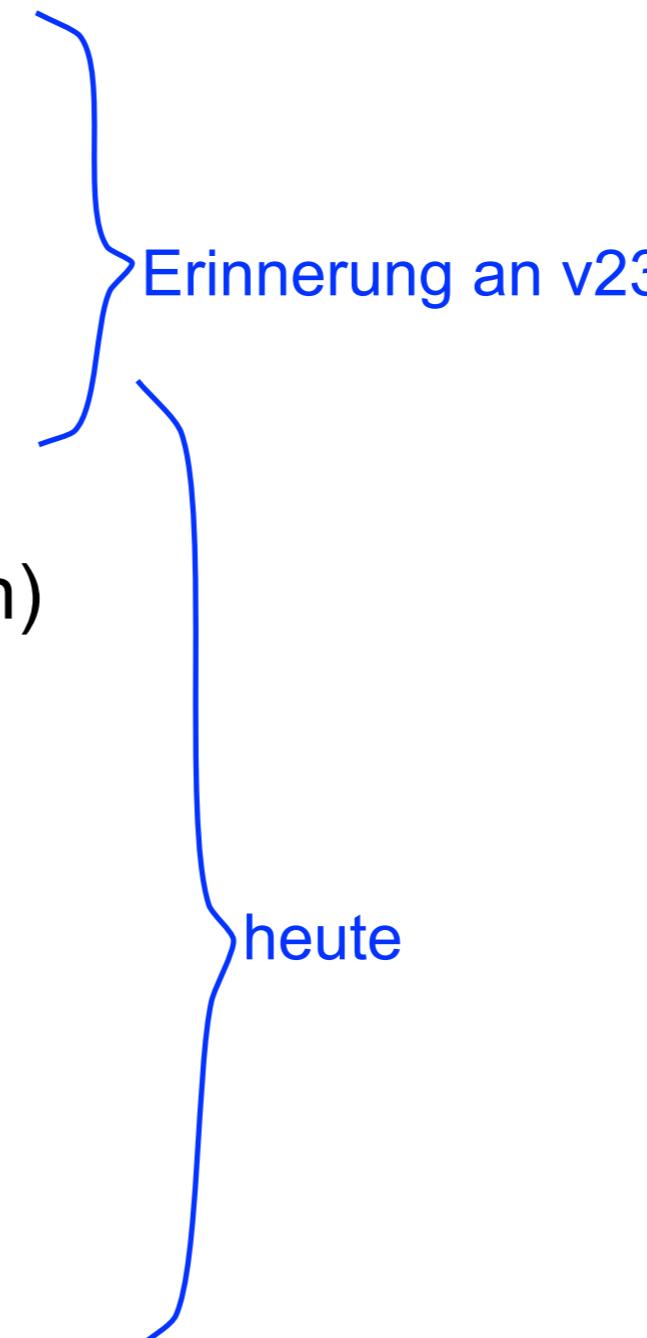
Vorlesung-Website

 Johannes Blümer

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- Standardmodell
 - ...
- Hinweise auf Dunkle Materie
 - Rotationskurven, Clusterdynamik
 - Gravitationslinsen
 - (Kosmologie)
- (Suche nach Annihilationssignalen)
- Suche nach Streuprozessen
 - Bolometer, Flüssiggas-Detektoren
 - DAMA
 - Ausschlusskurven
- Kosmische Strahlung
 - Beschleunigung
 - Ausbreitung
 - Luftschaueophysik
 - die höchsten Energien



Gravitationsbindung im Coma-Haufen?



Fritz Zwicky
(1898-1974)

Helv. Phys. Acta 6
110-127 (1933)
'Die Rotverschiebung
von extragalaktischen
Nebeln'

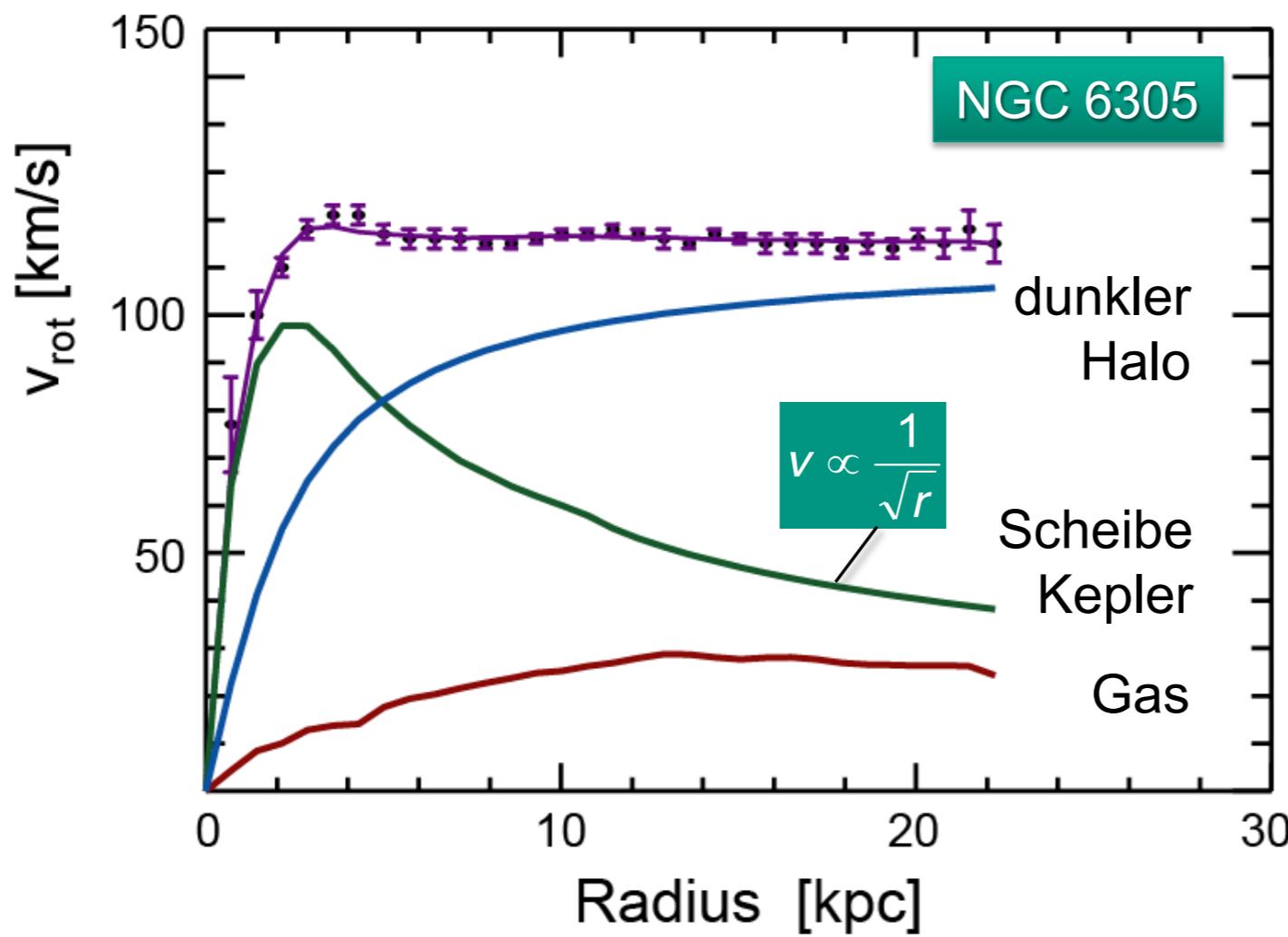
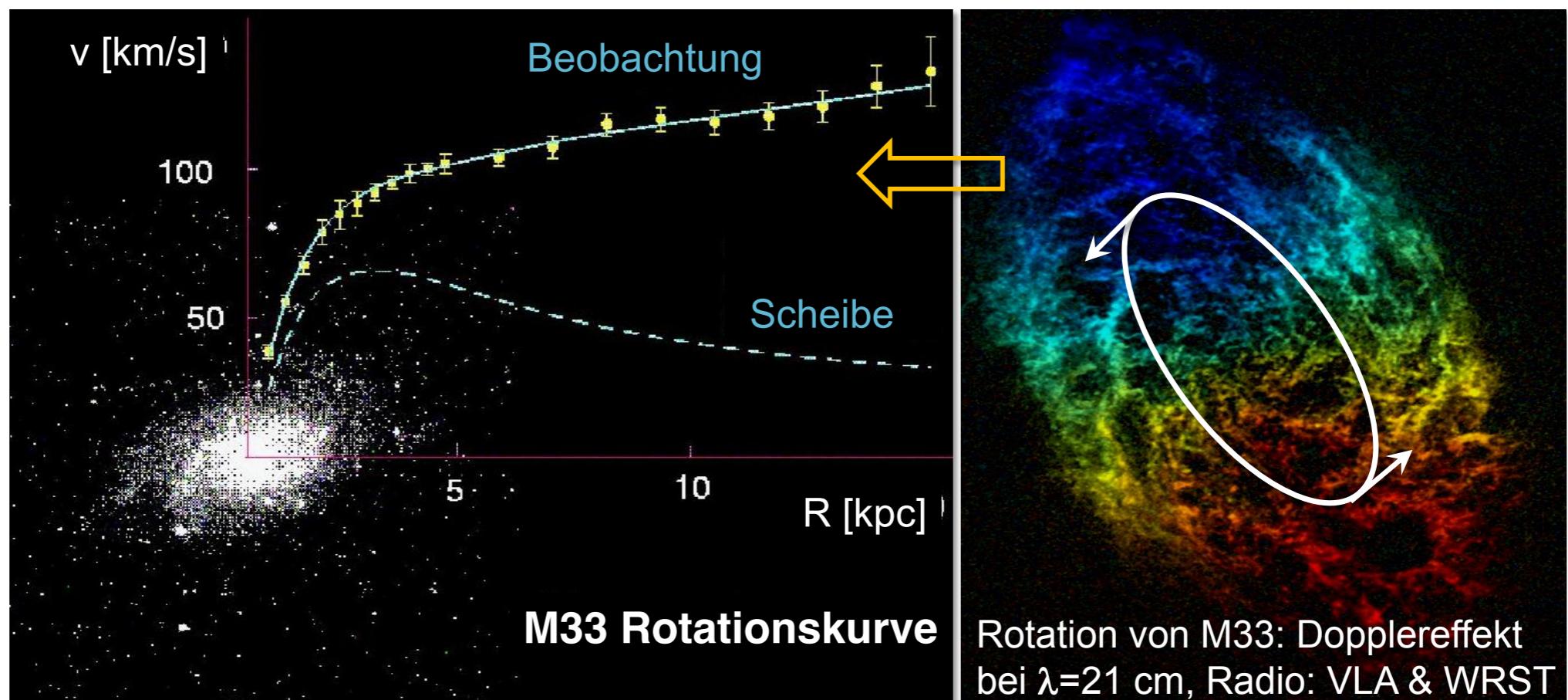
Virialsatz:
 $T = -U/2$

90% der Coma-
Masse ist nicht
sichtbar...???



**Should this turn out to be
true, the surprising result
would follow that dark matter
is present in a much higher
density than radiating matter"**

Rotations- kurven



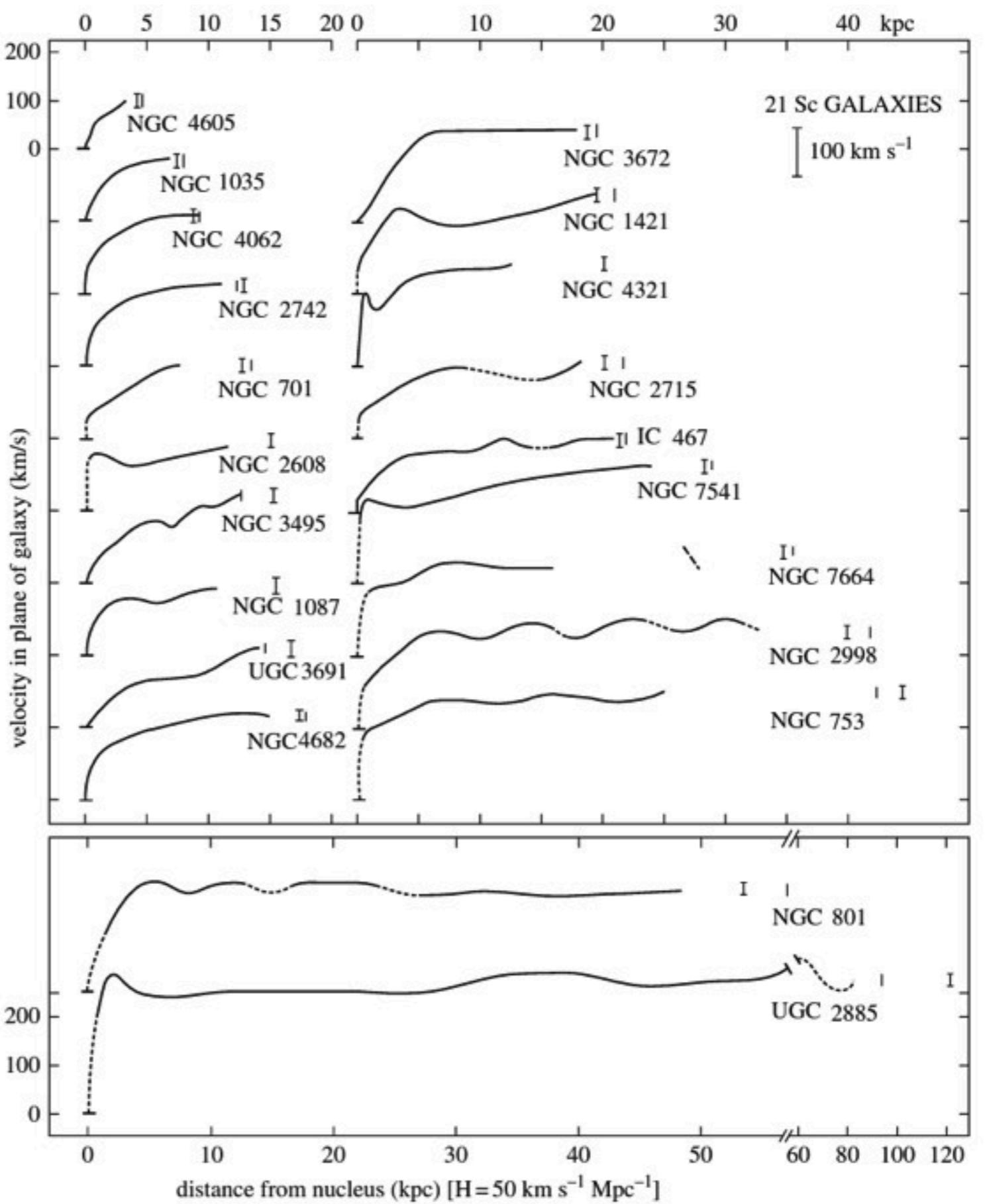
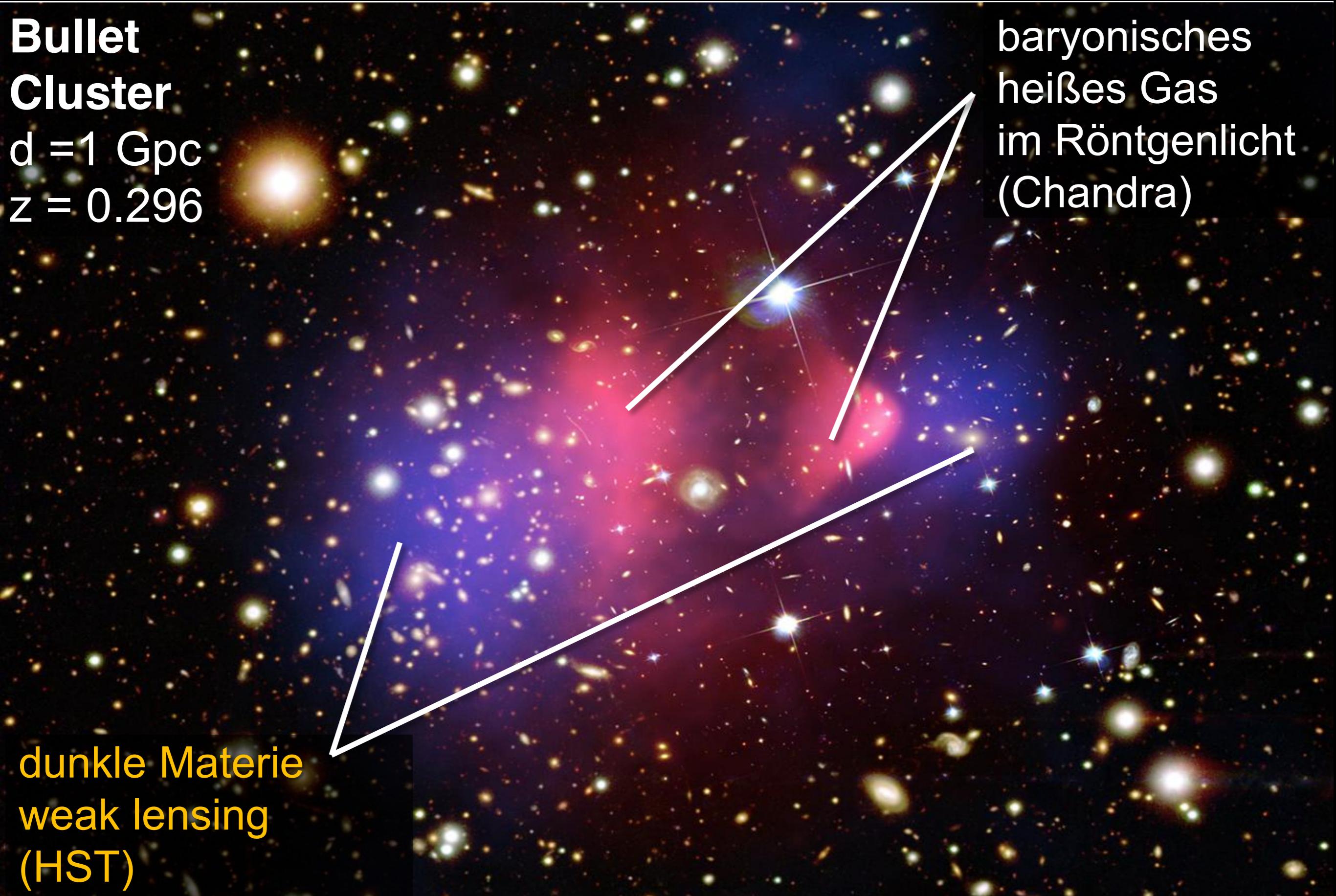


Fig. 4.12. The optically determined rotation curves of 21 spiral galaxies by Rubin, Ford and Thonnard (1980).

Bullet Cluster

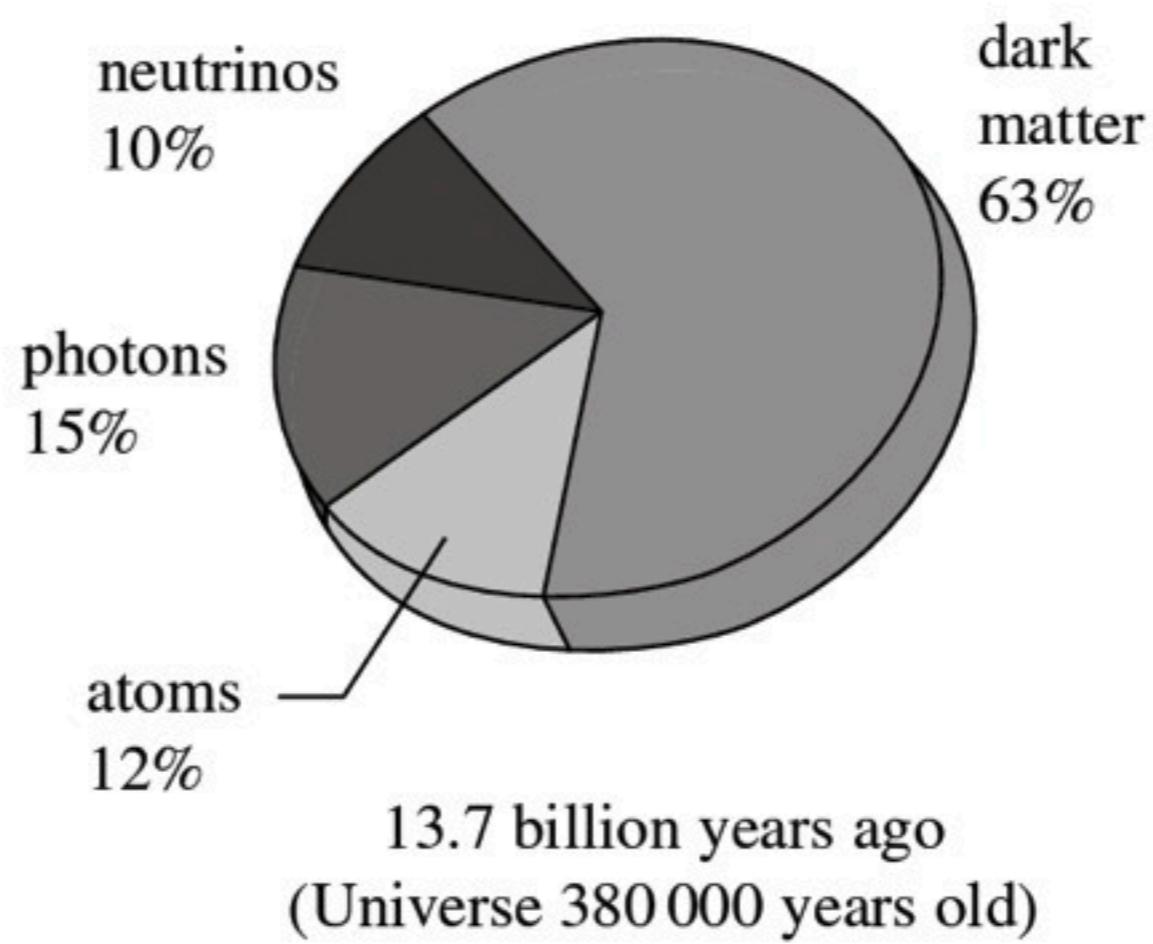
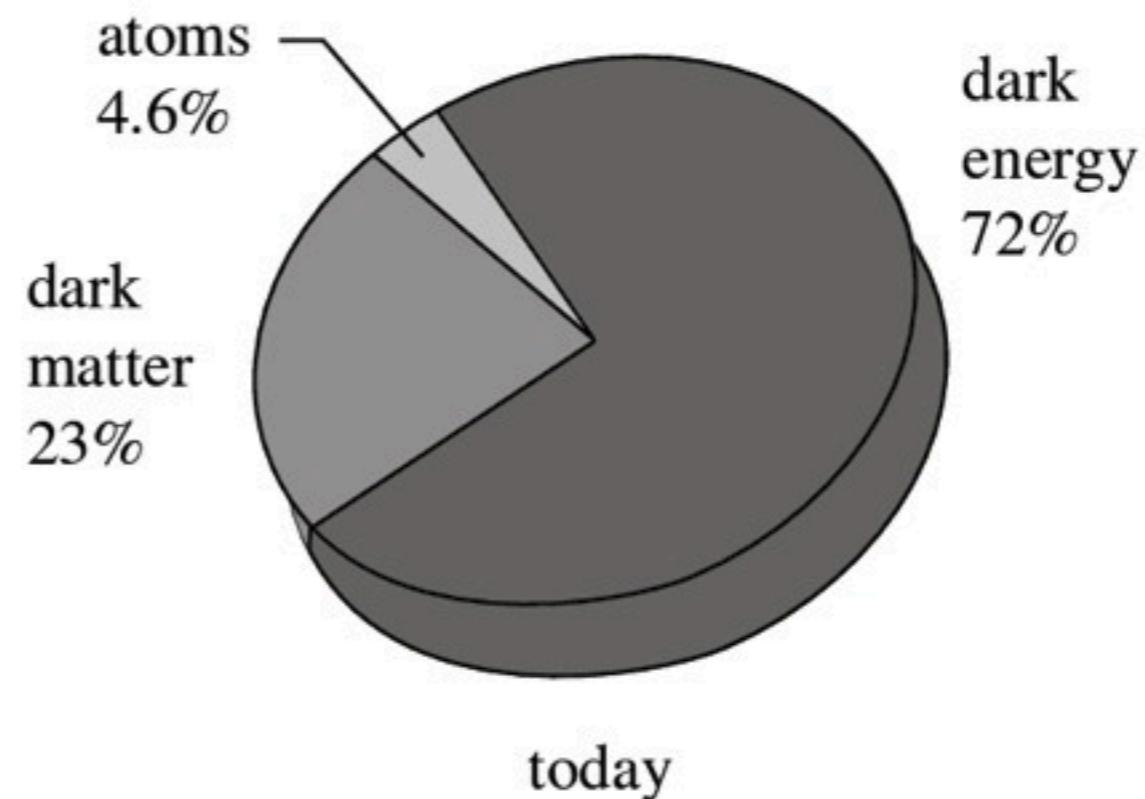
$d = 1 \text{ Gpc}$
 $z = 0.296$



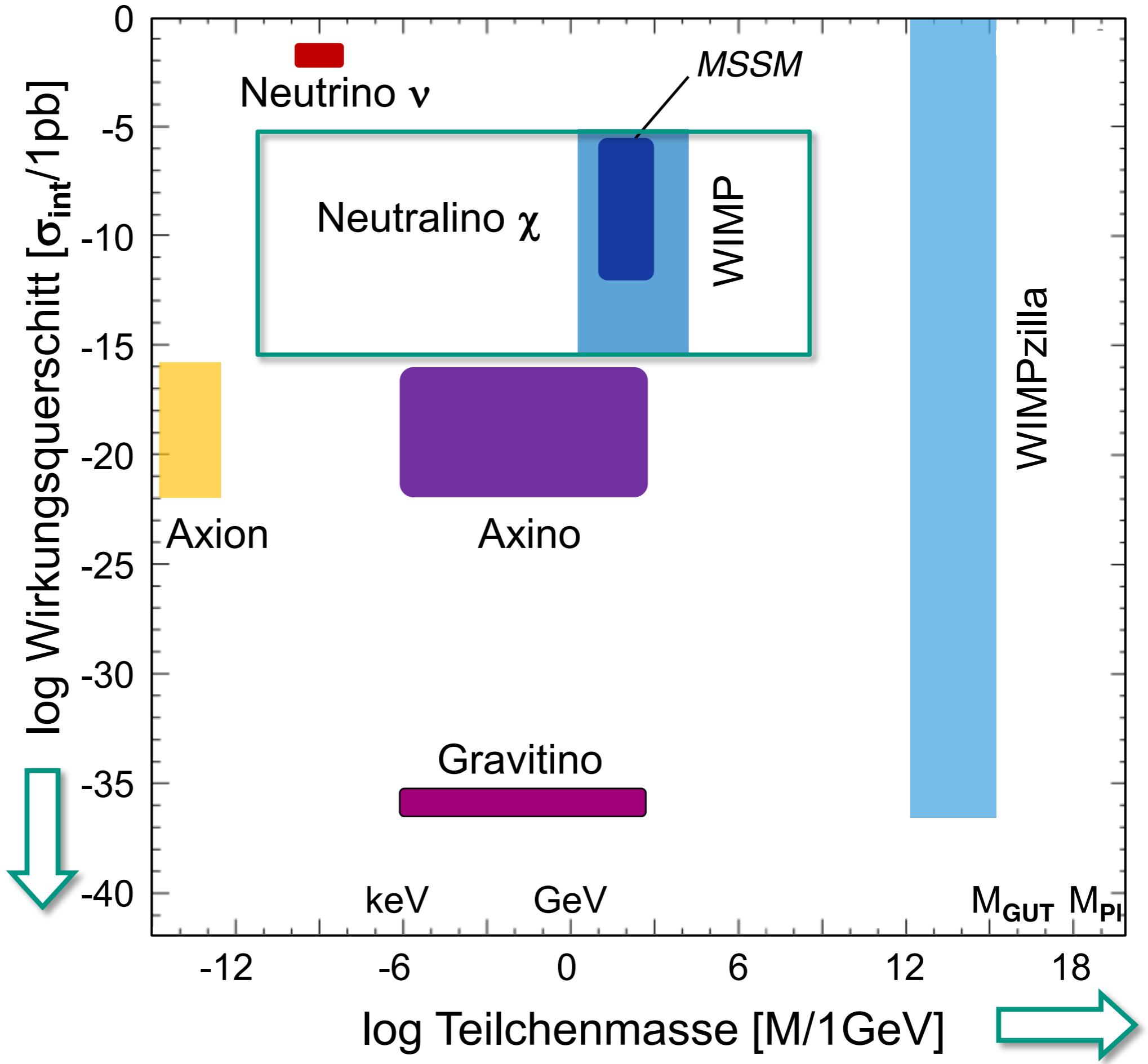
baryonisches
heißes Gas
im Röntgenlicht
(Chandra)

dunkle Materie
weak lensing
(HST)

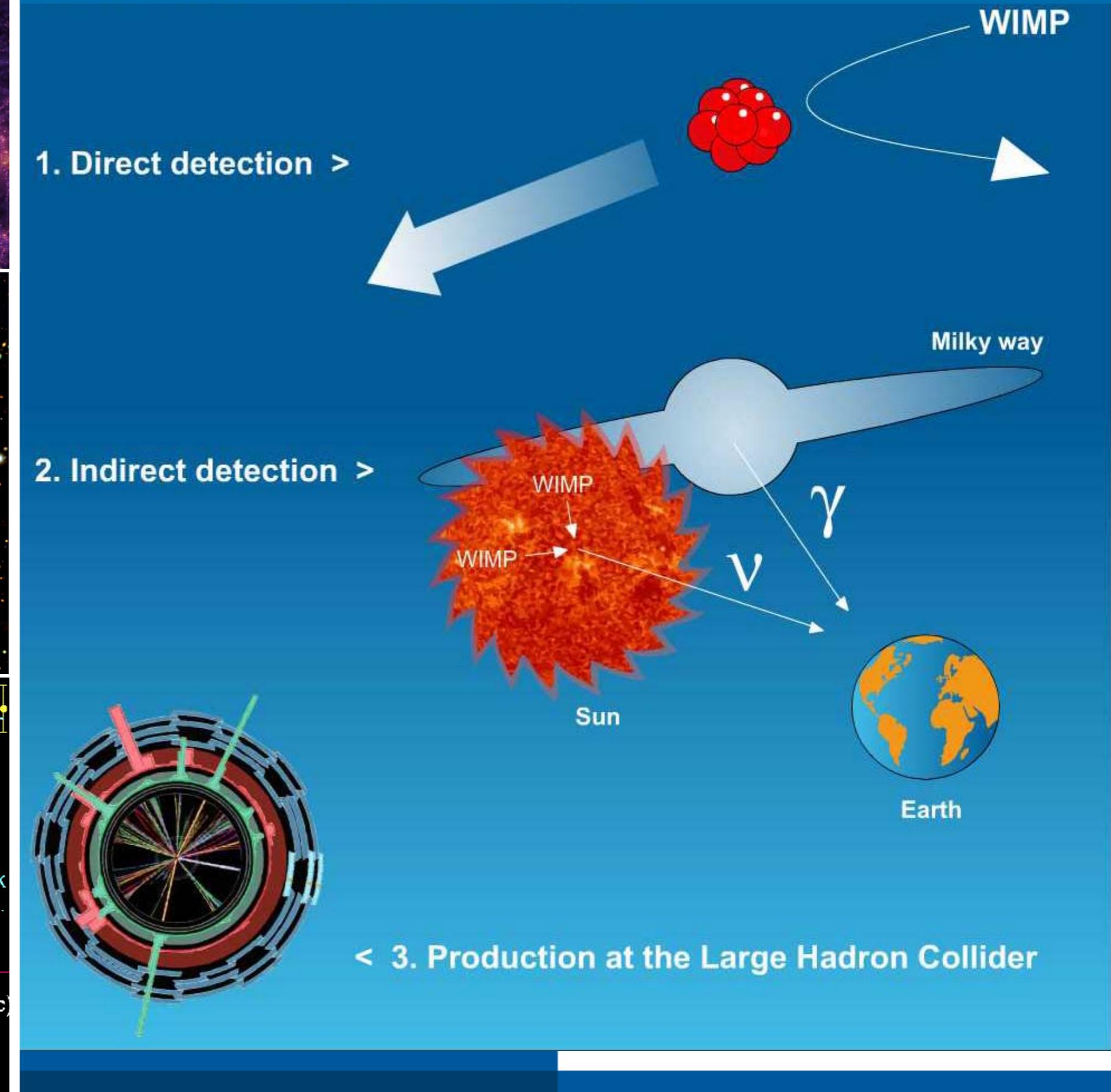
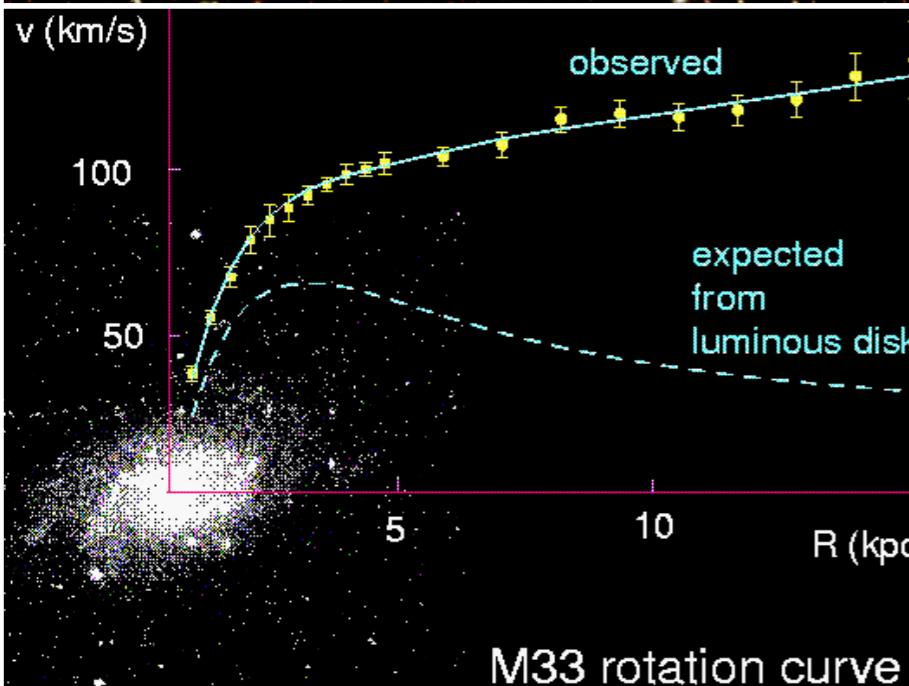
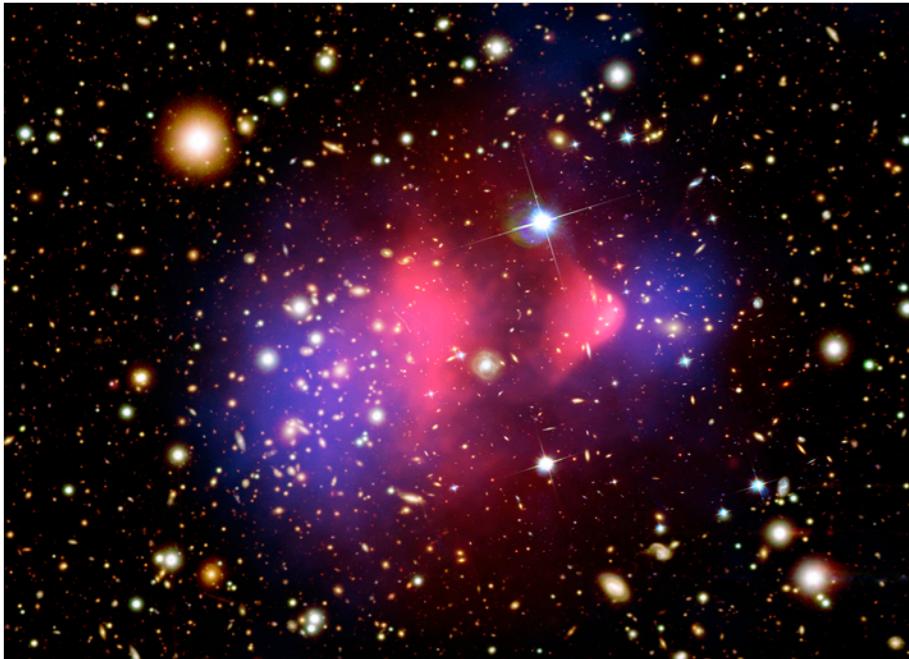
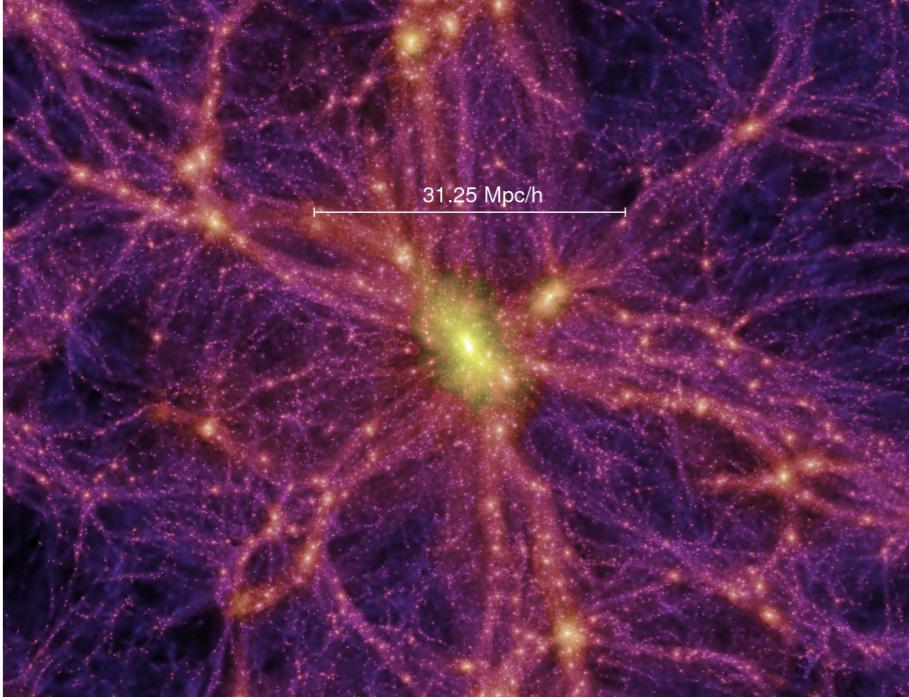
Energie-Massenbudget



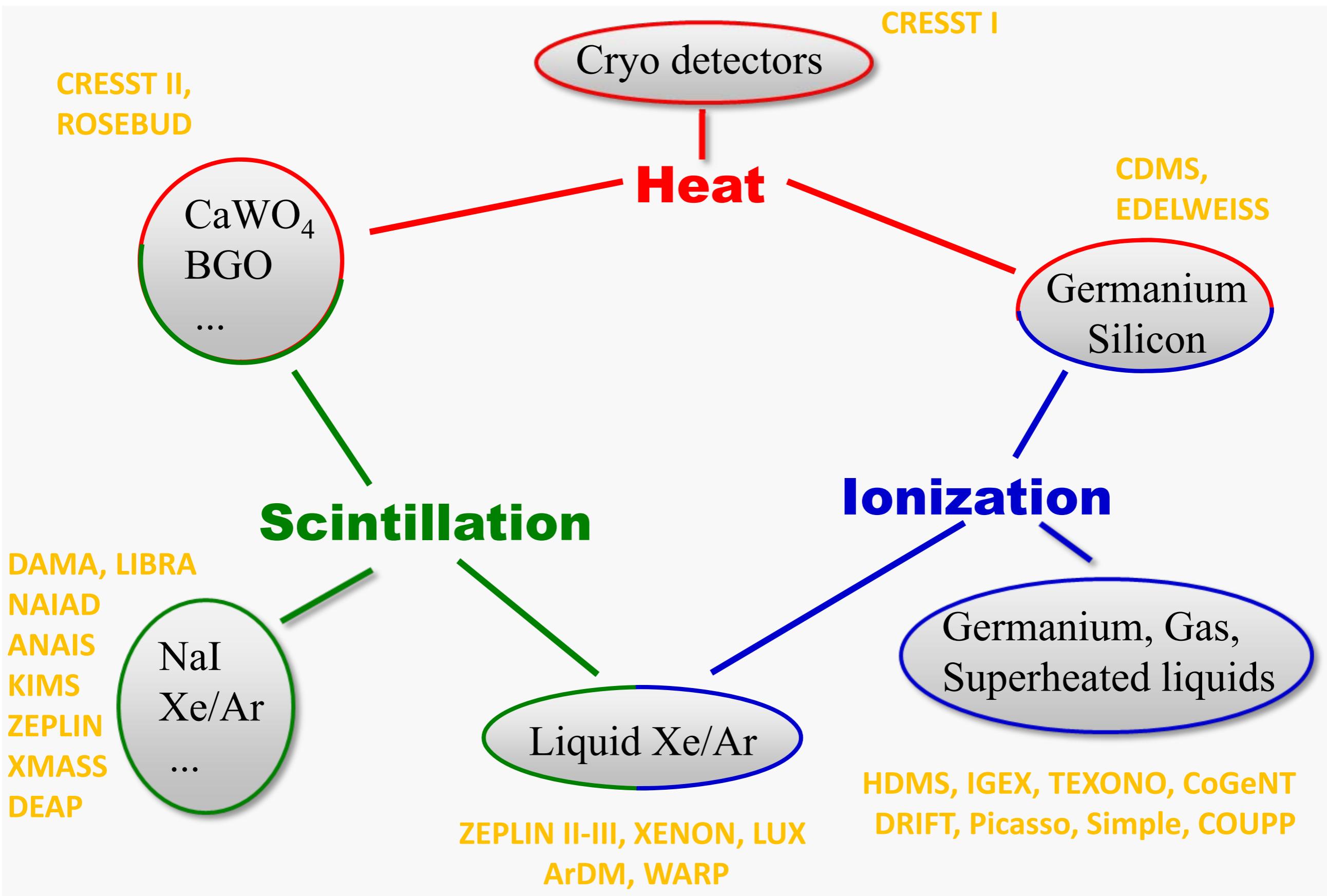
DM-Teilchen



The quest for Dark Matter



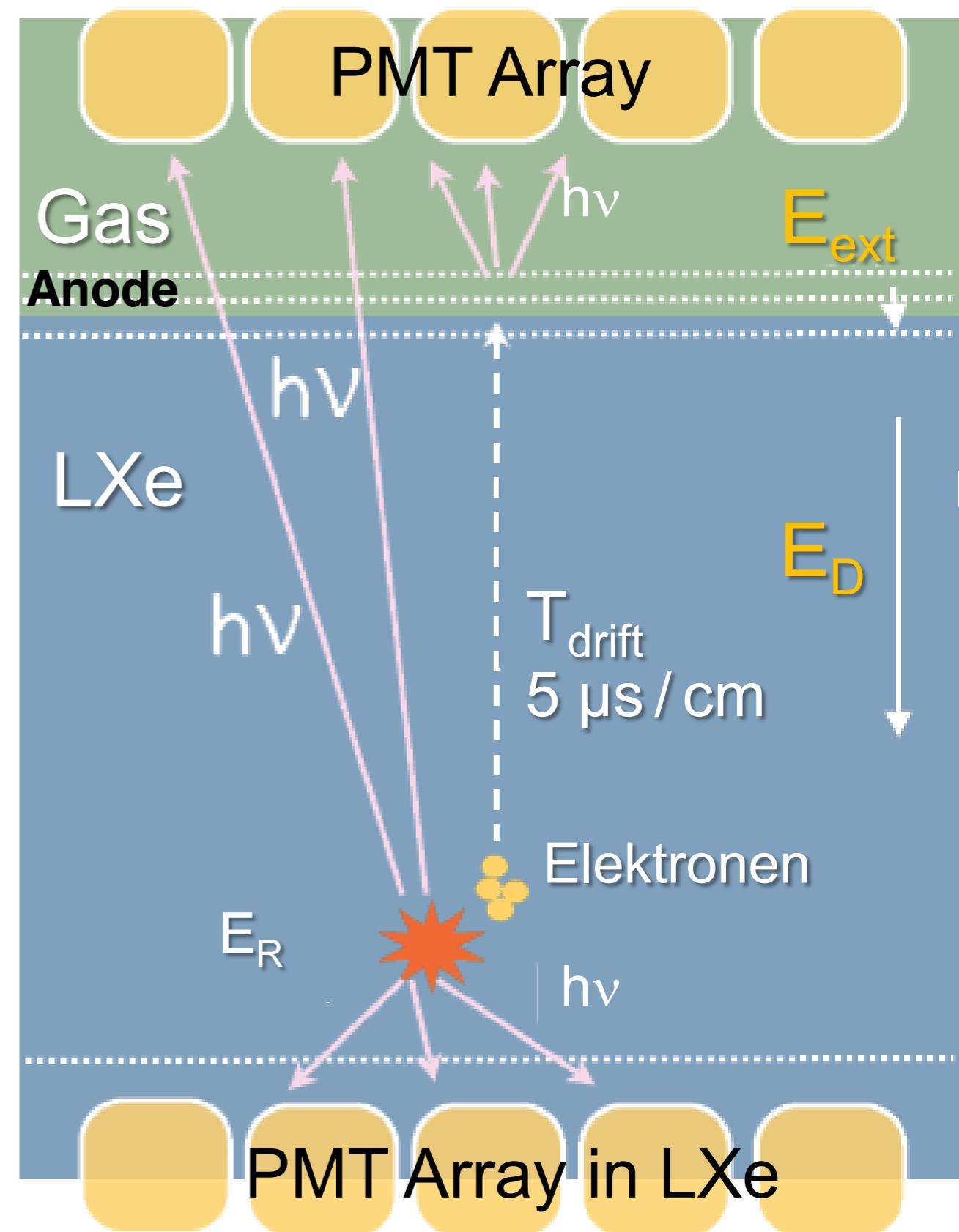
Direkte Messmethoden



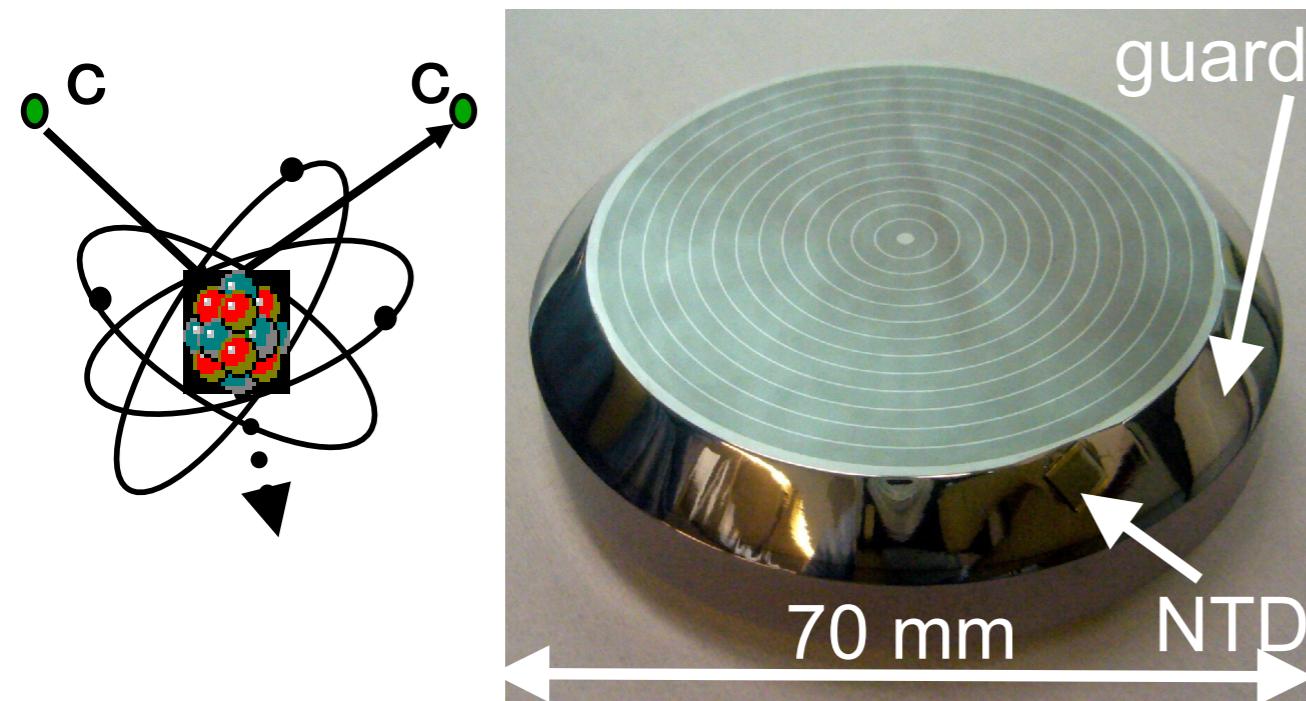
EDELWEISS



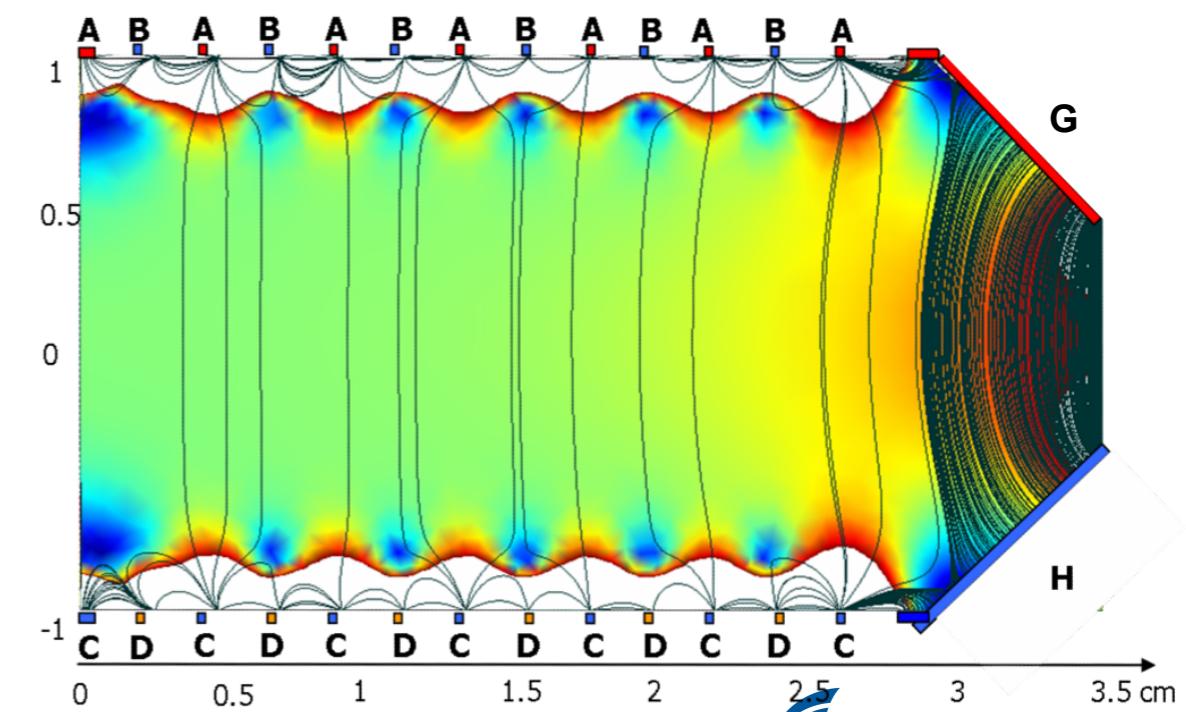
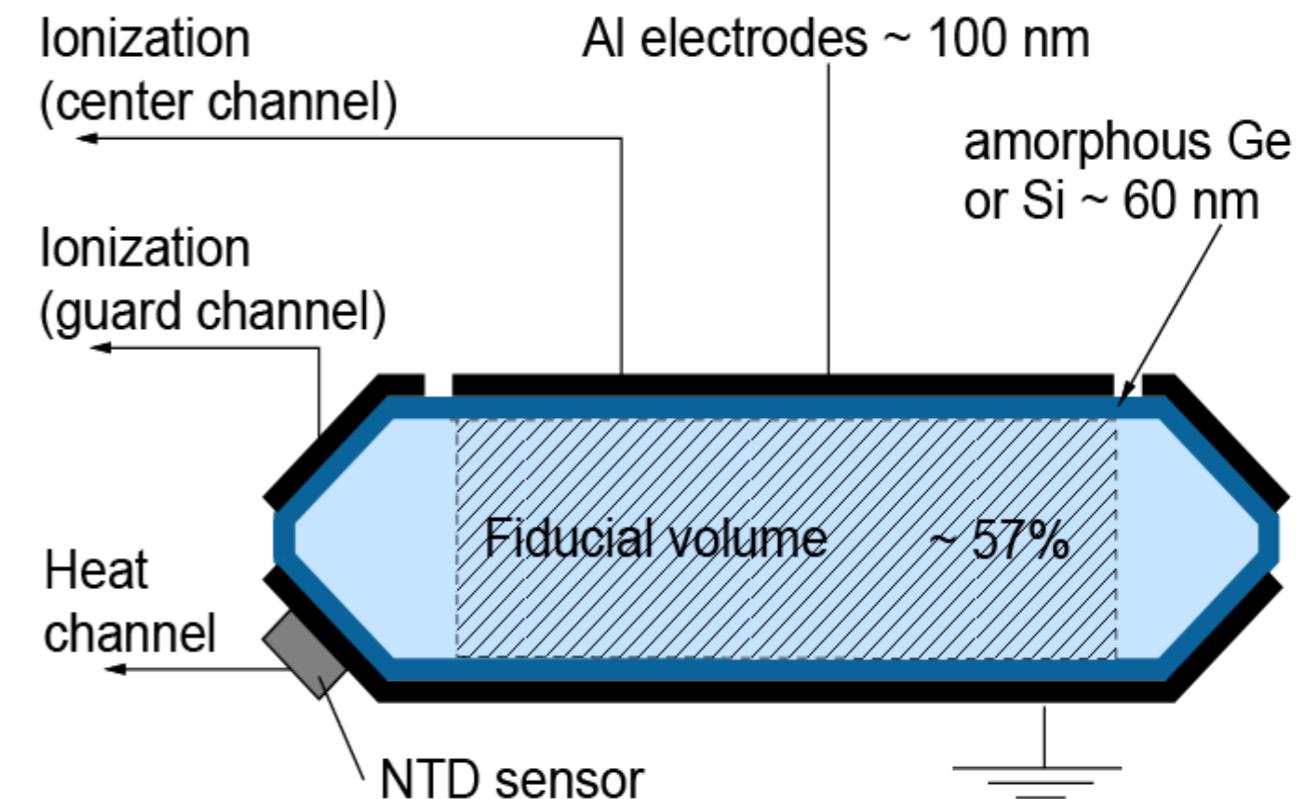
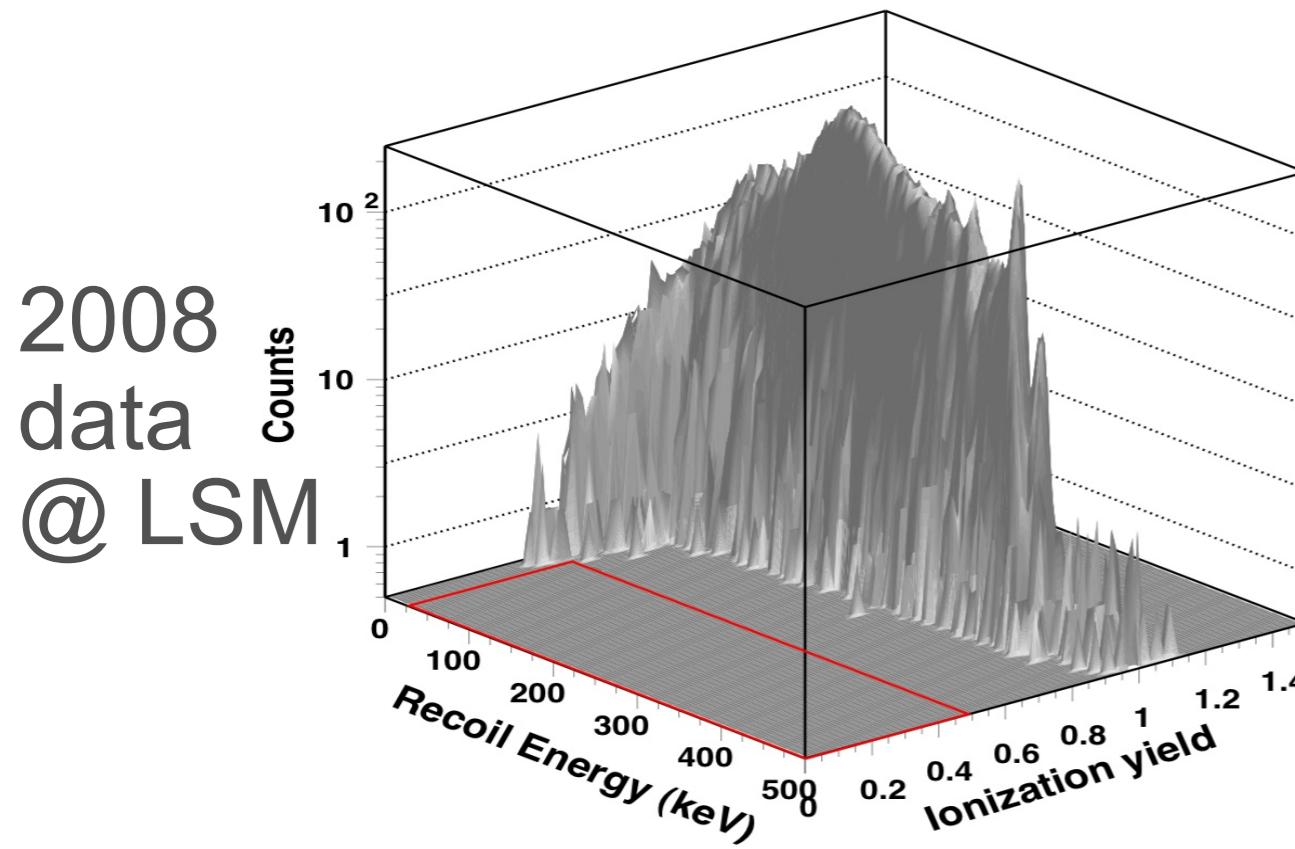
XENON



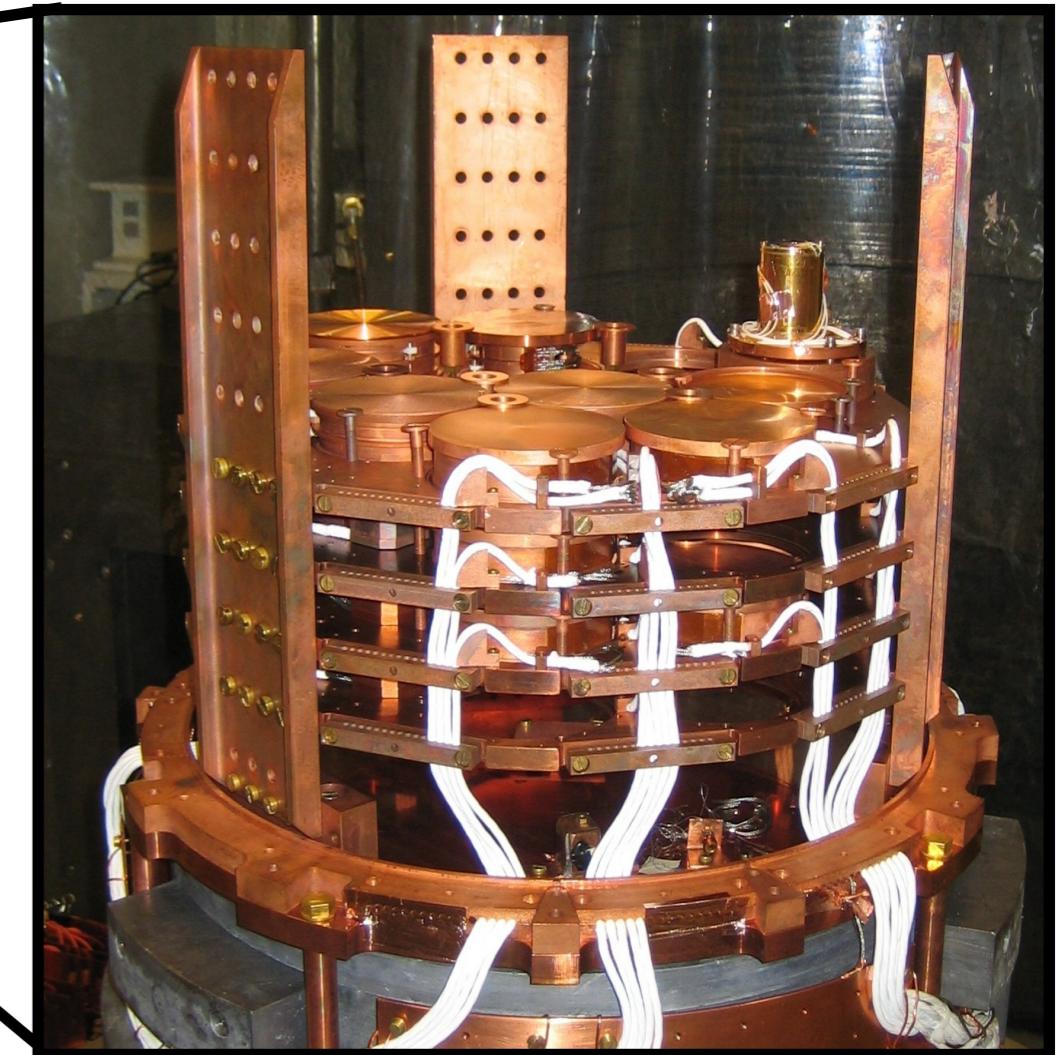
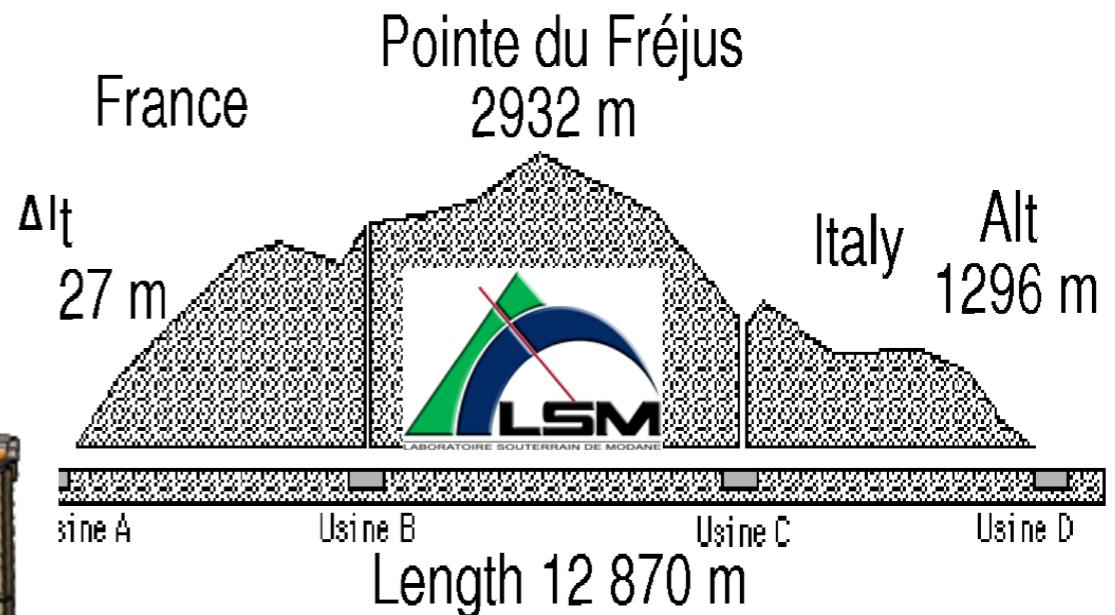
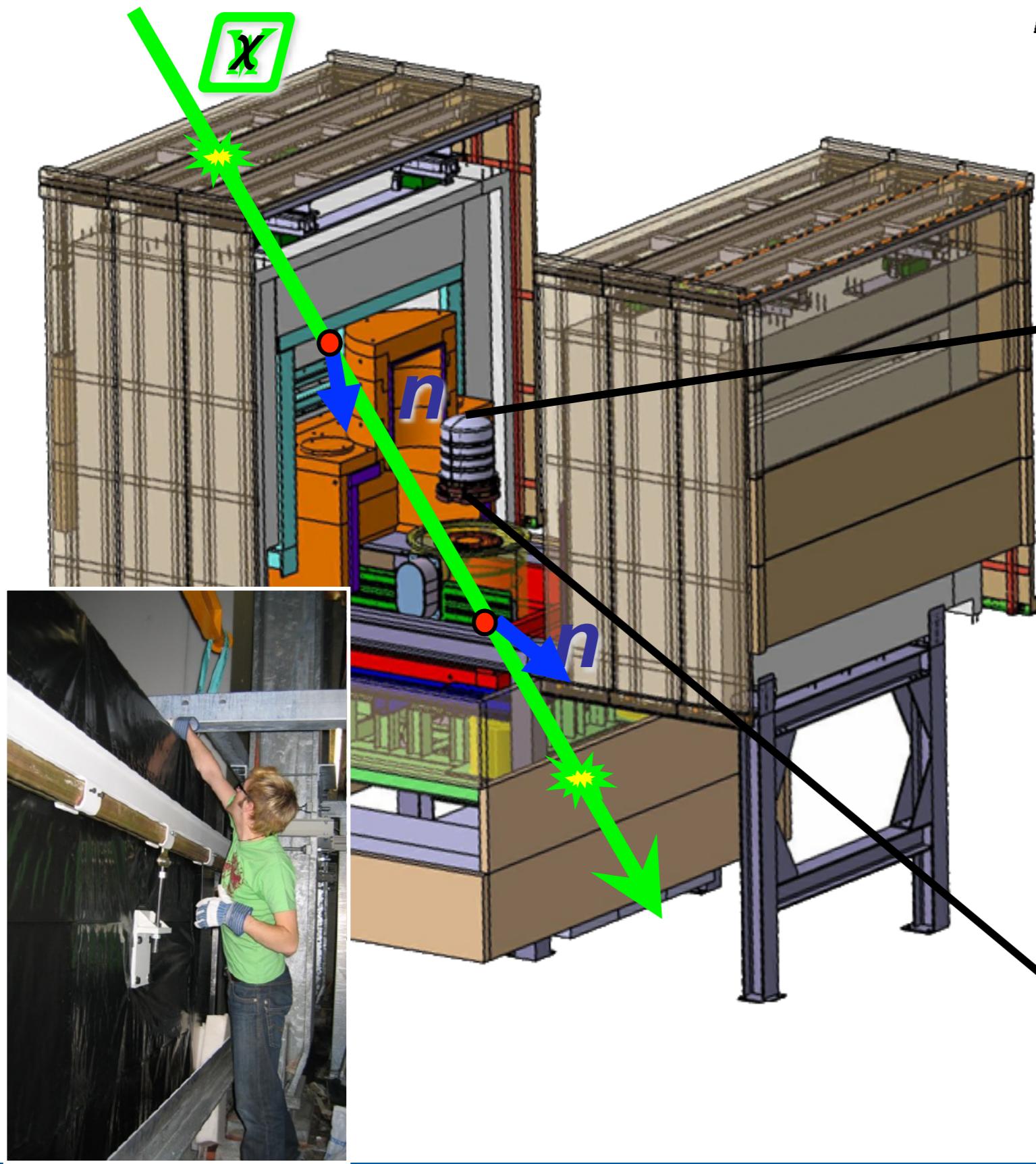
EDELWEISS DM detection technology



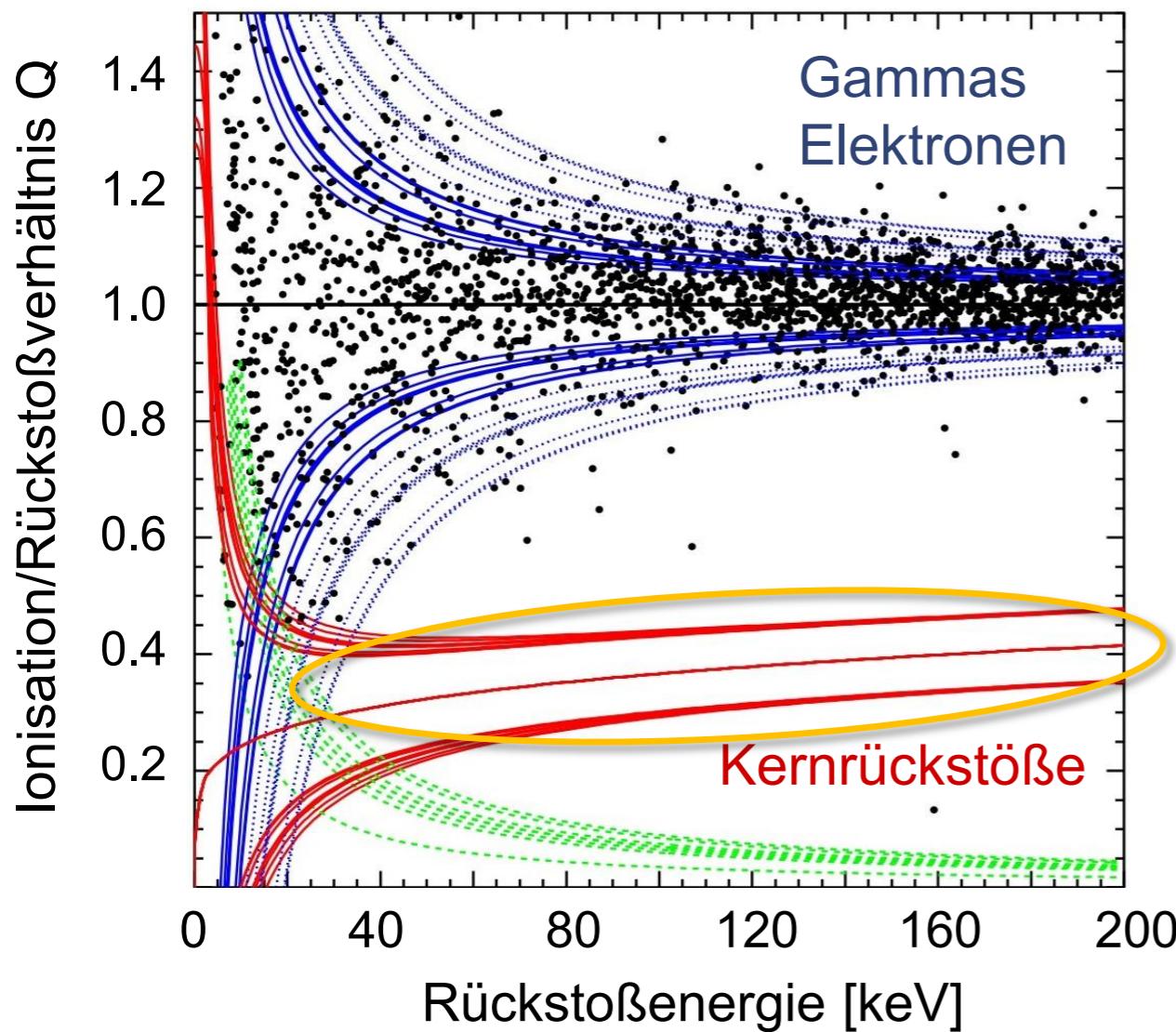
EDELWEISS - 133Ba calibration (93166 γ)



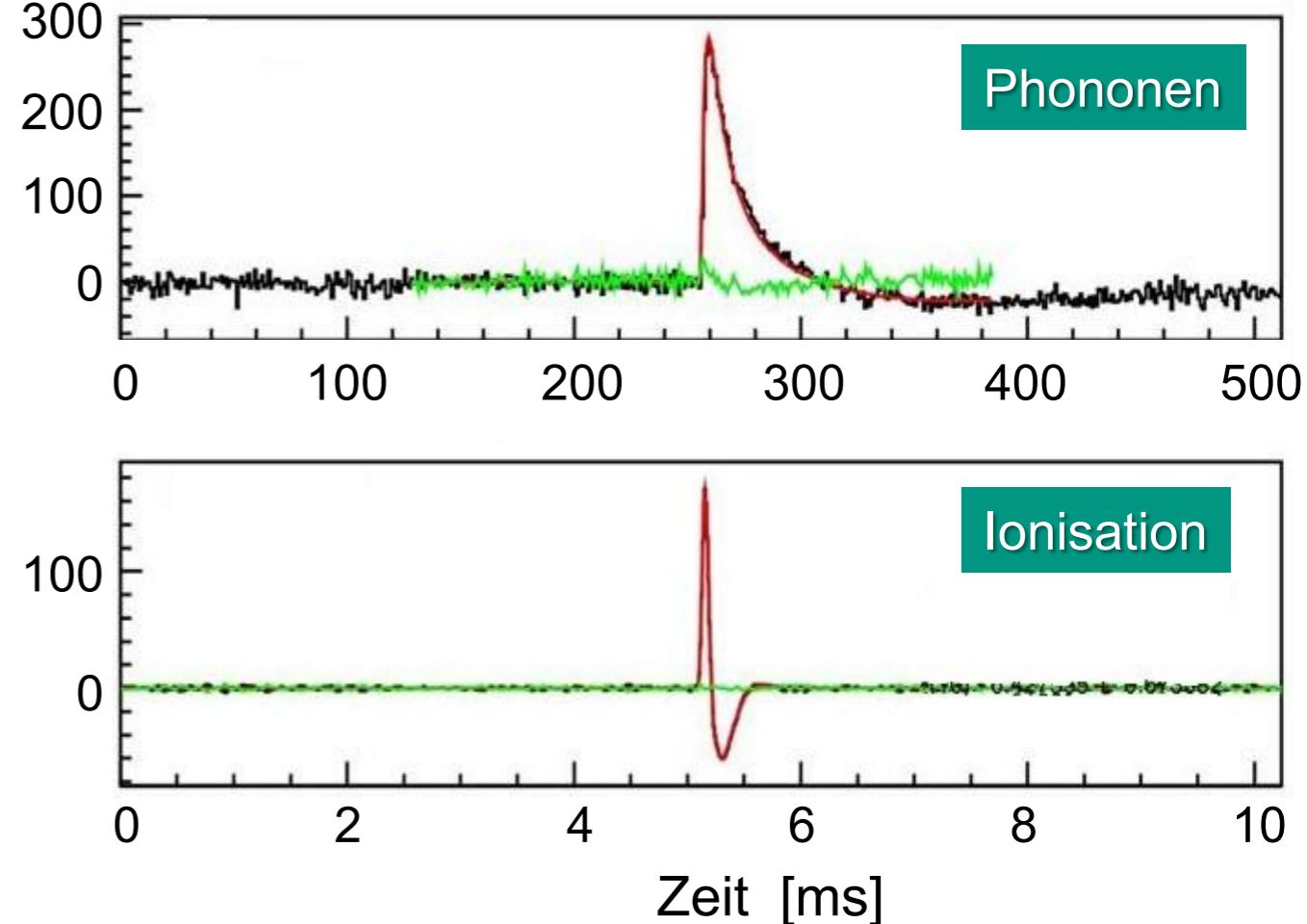
shielding concept



DM-Signatur in EDELWEISS

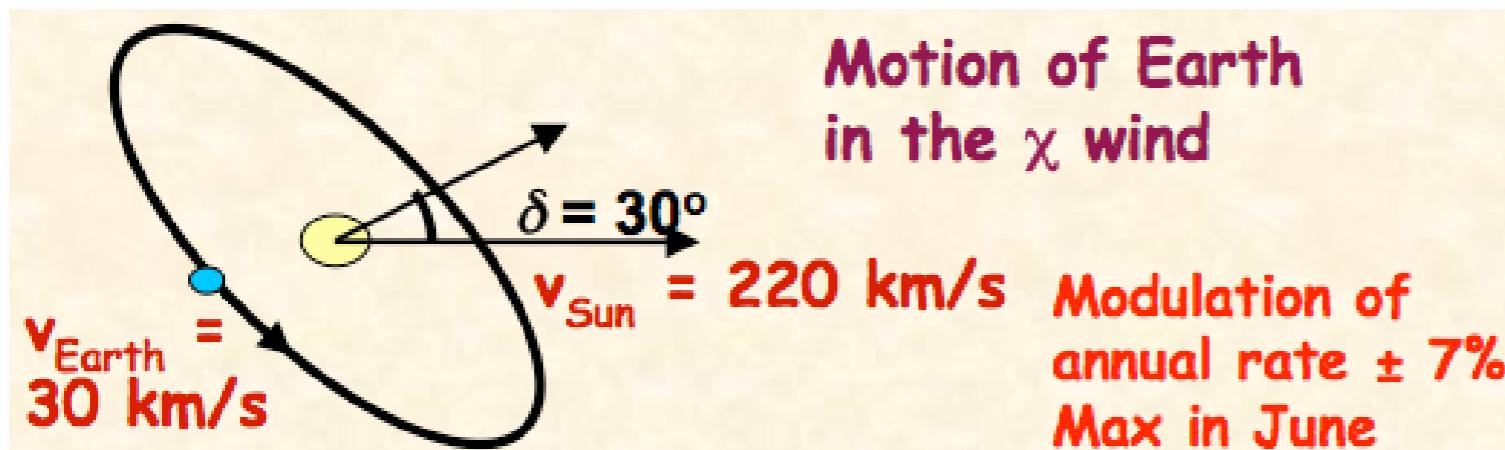


Koinzidenz: Phononsignal & Ionisation

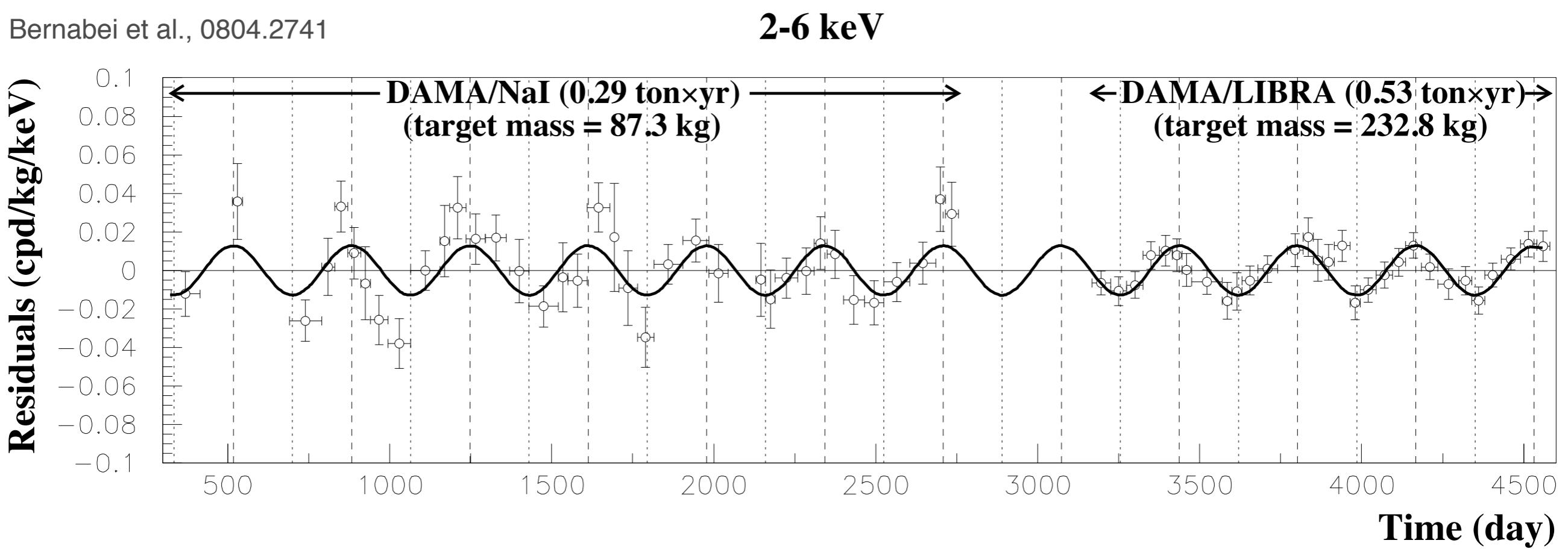


Definition der Untergrund- und Signalregionen durch Analyse-MC und Kalibration mit Gamma- und Neutronenquellen

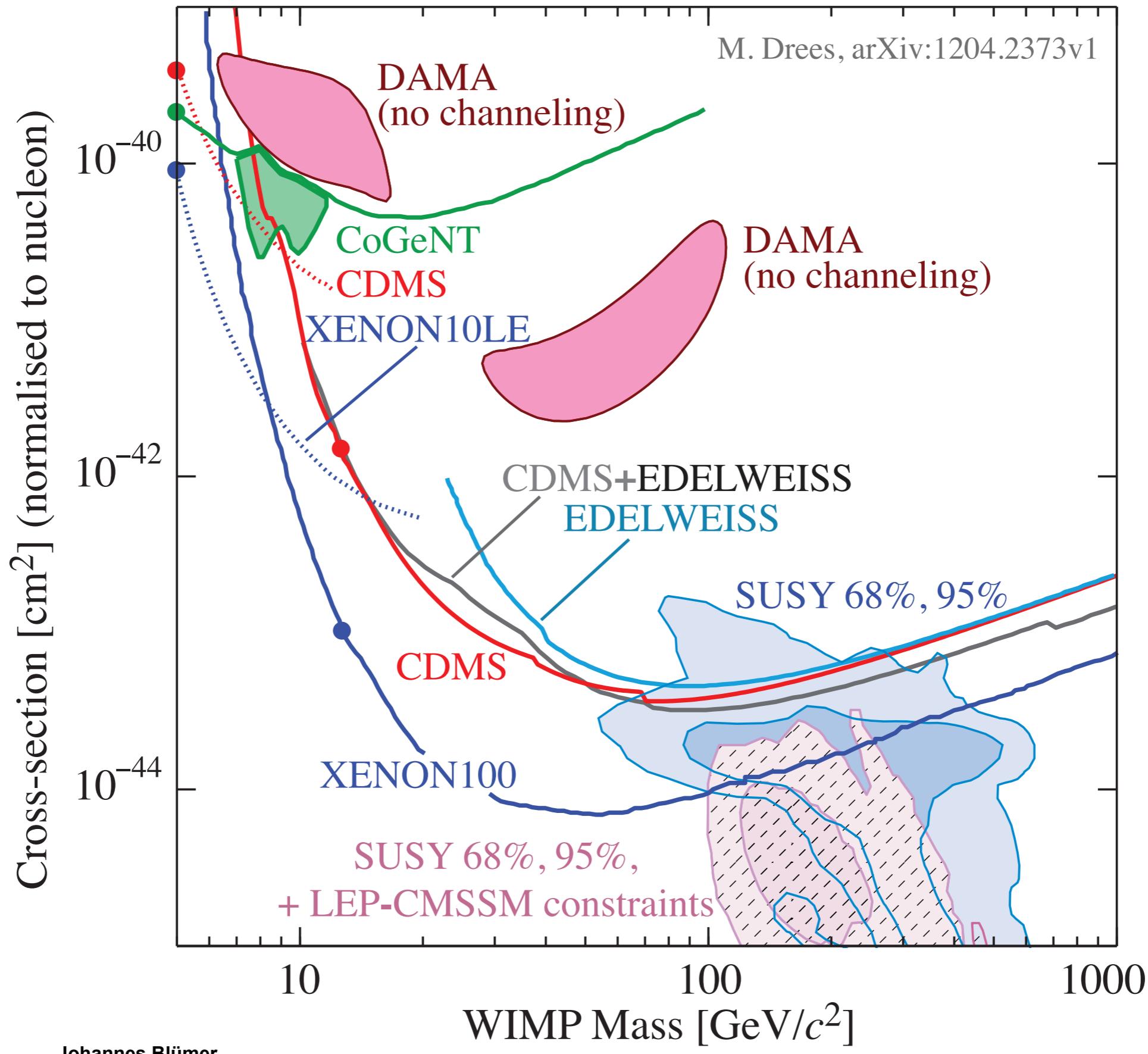
Das DAMA-”Signal”



Bernabei et al., 0804.2741



Grenzen für Spin-unabhängige WW



Grenzen für Spin-abhängige WW

M. Drees, arXiv:1204.2373v1

