

# A few ruminations

A few ruminations  
or  
confessions of a nihilist

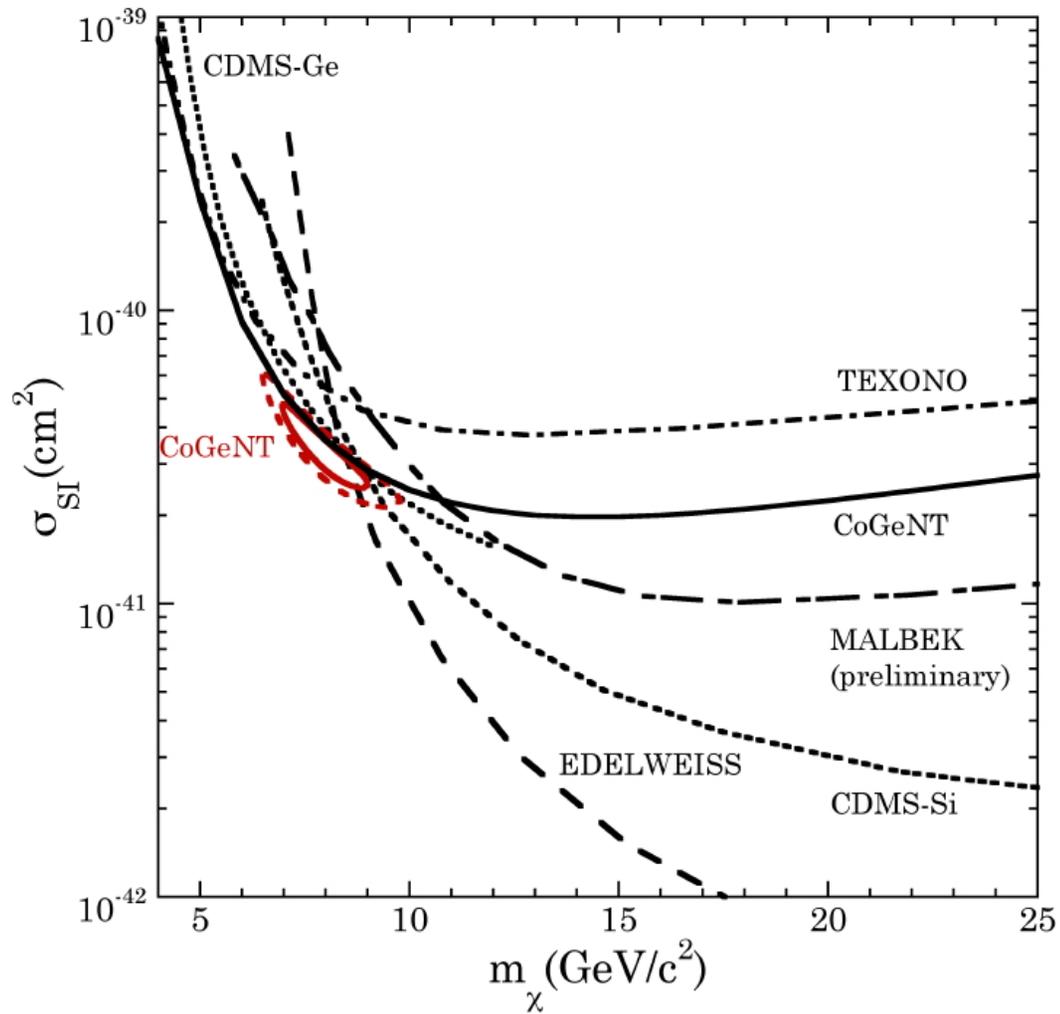


A few ruminations  
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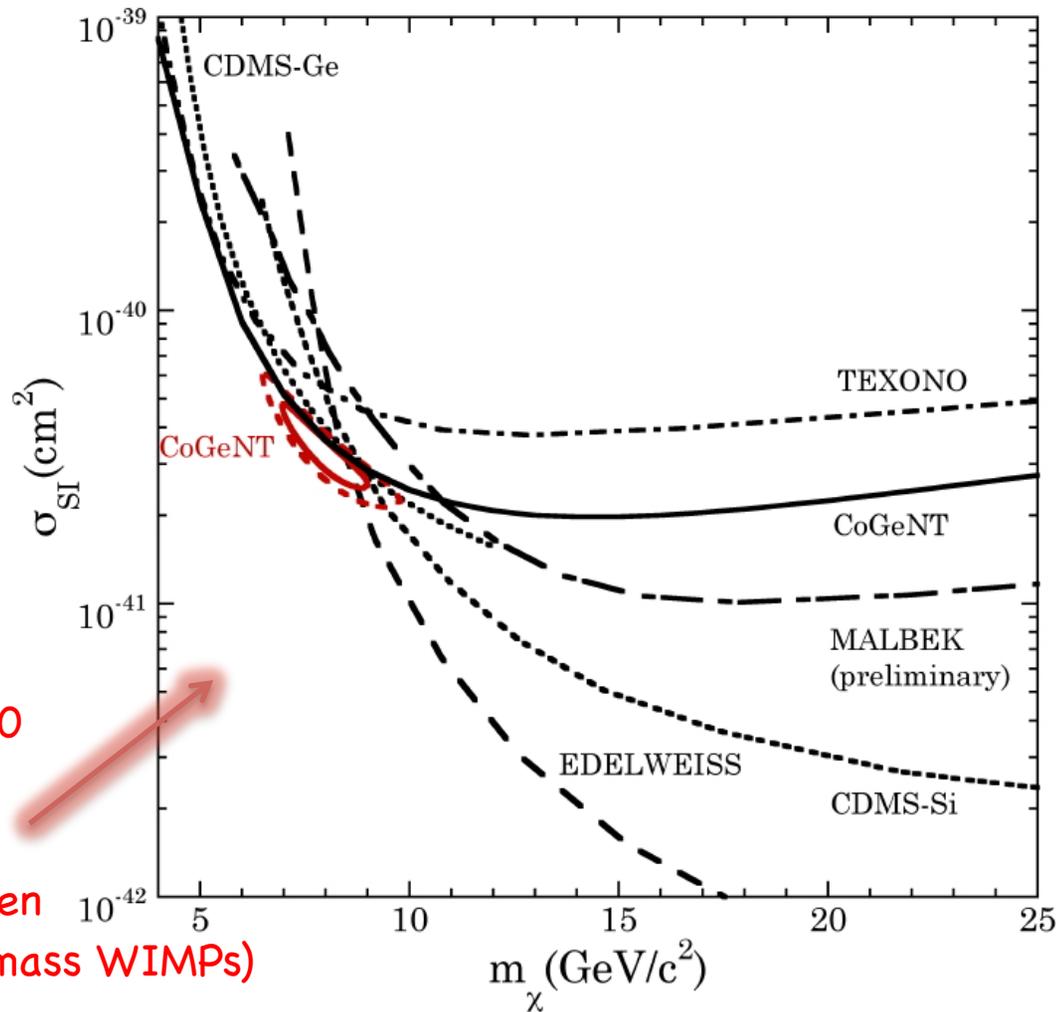
**"Ve are nihilists - ve believe in nussing"**

# A story better told in pictures



**The side of me that wants to believe**

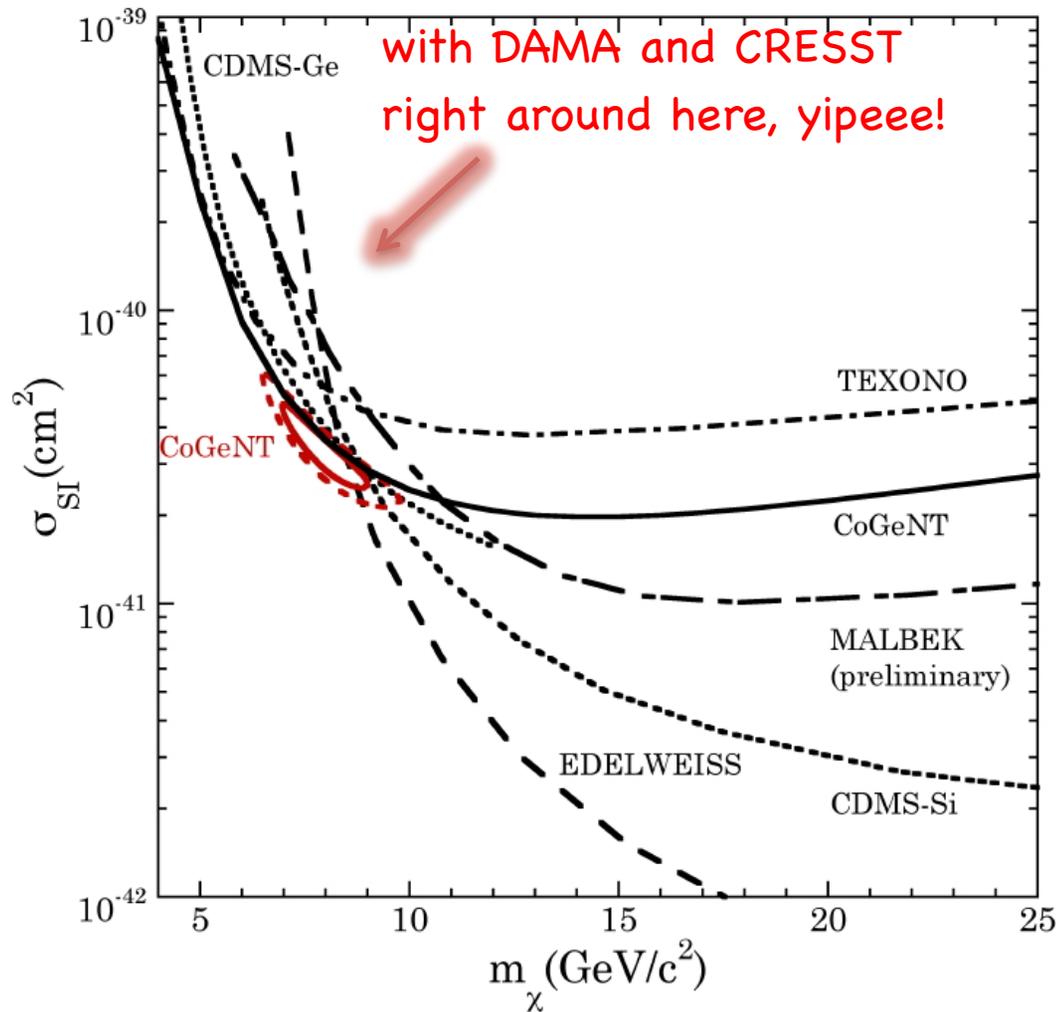
# A story better told in pictures



(notice how  
neither XENON10  
nor XENON100  
play any role in  
my thinking, when  
it is about low-mass WIMPs)

The side of me that wants to believe

# A story better told in pictures

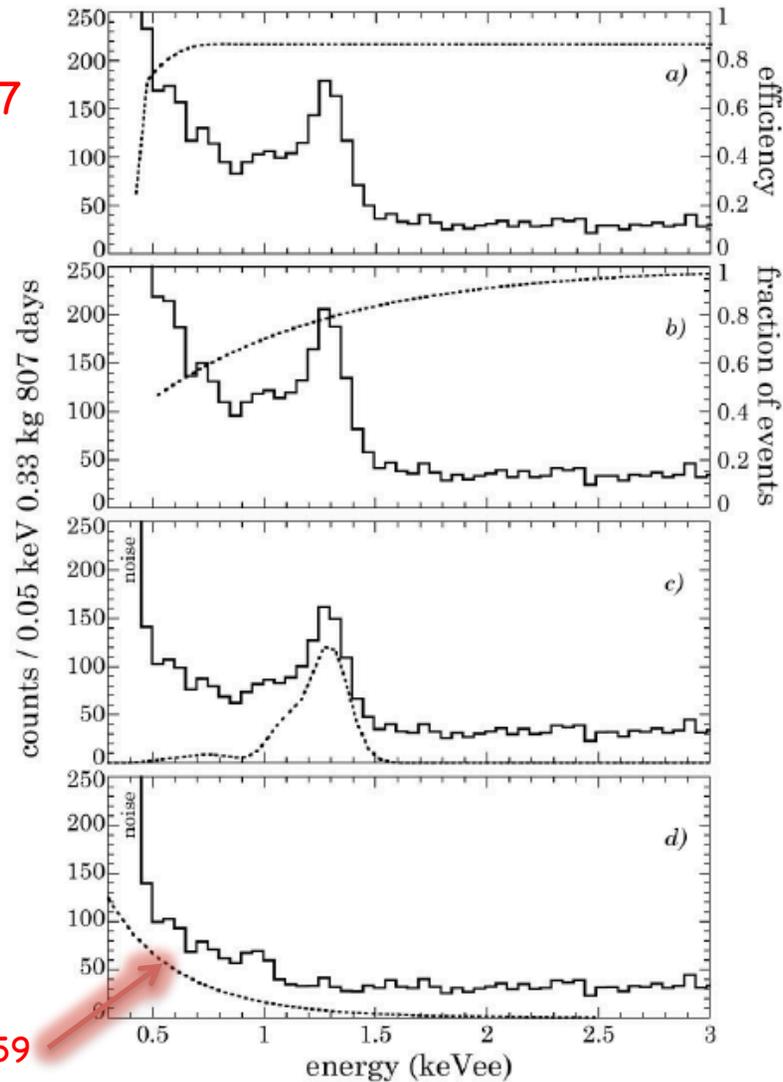


(also, all Ge detectors in this fig. are seeing an uncannily similar low-E rise)

The side of me that wants to believe

# A story better told in pictures

arXiv:1208.5737

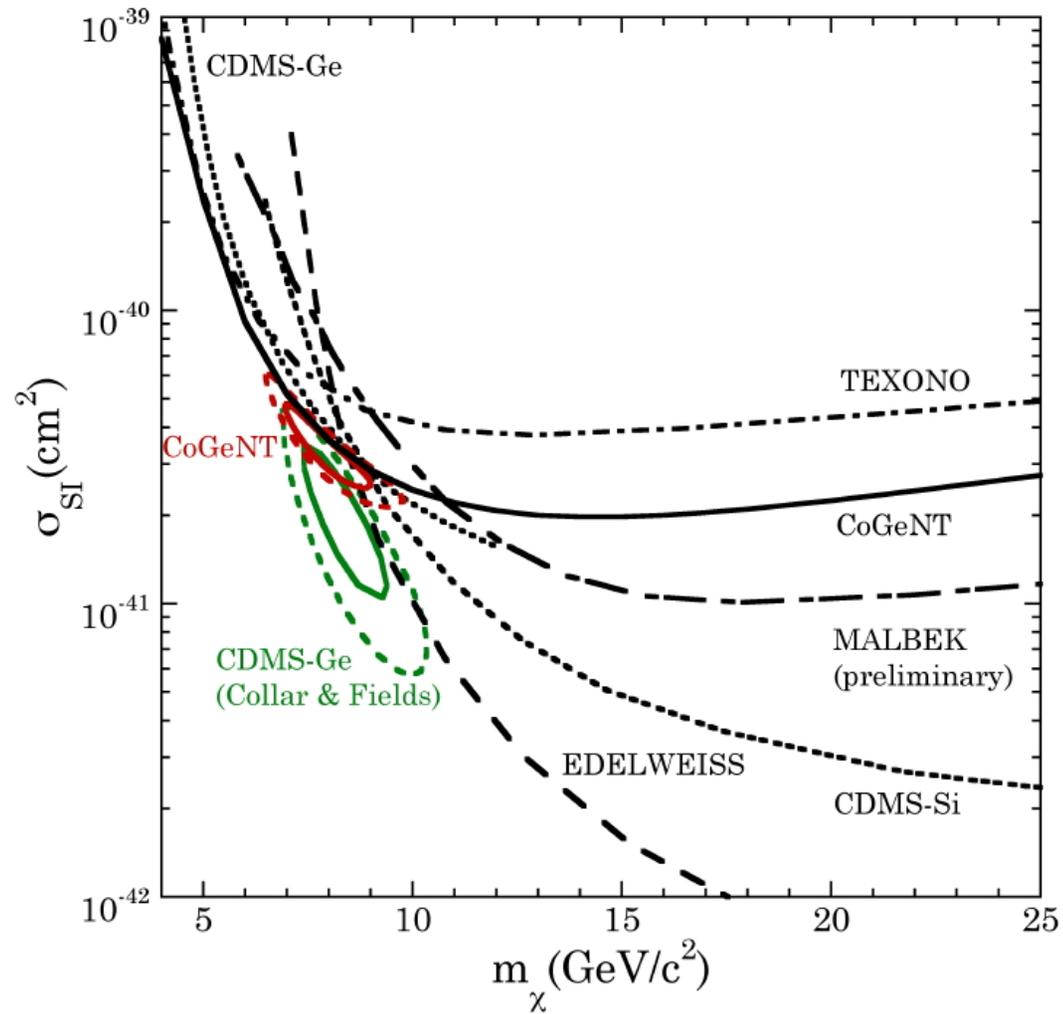


(also, all Ge detectors in this fig. are seeing an uncannily similar low-E rise)

Best fit to CDMS  
NR excess in arXiv:1204.3559

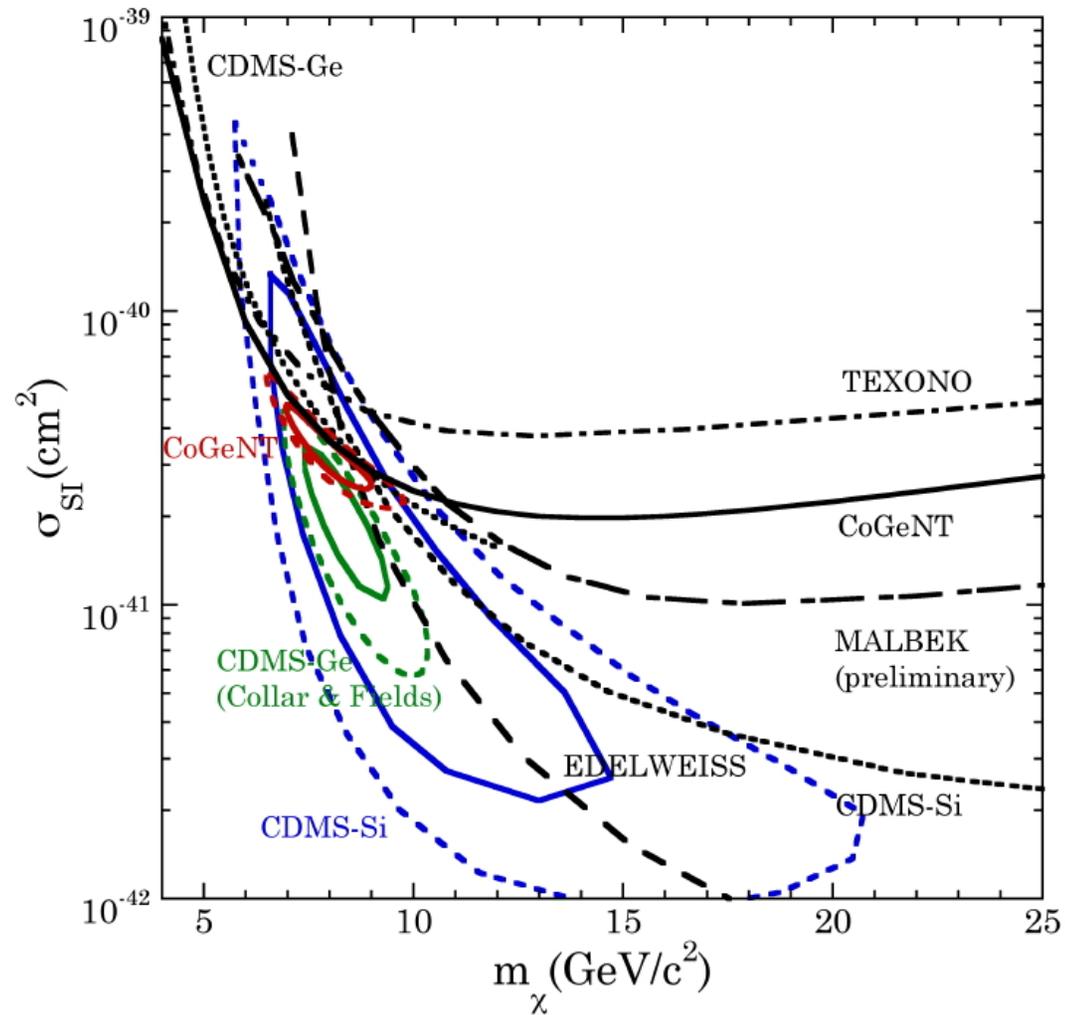
The side of me that wants to believe

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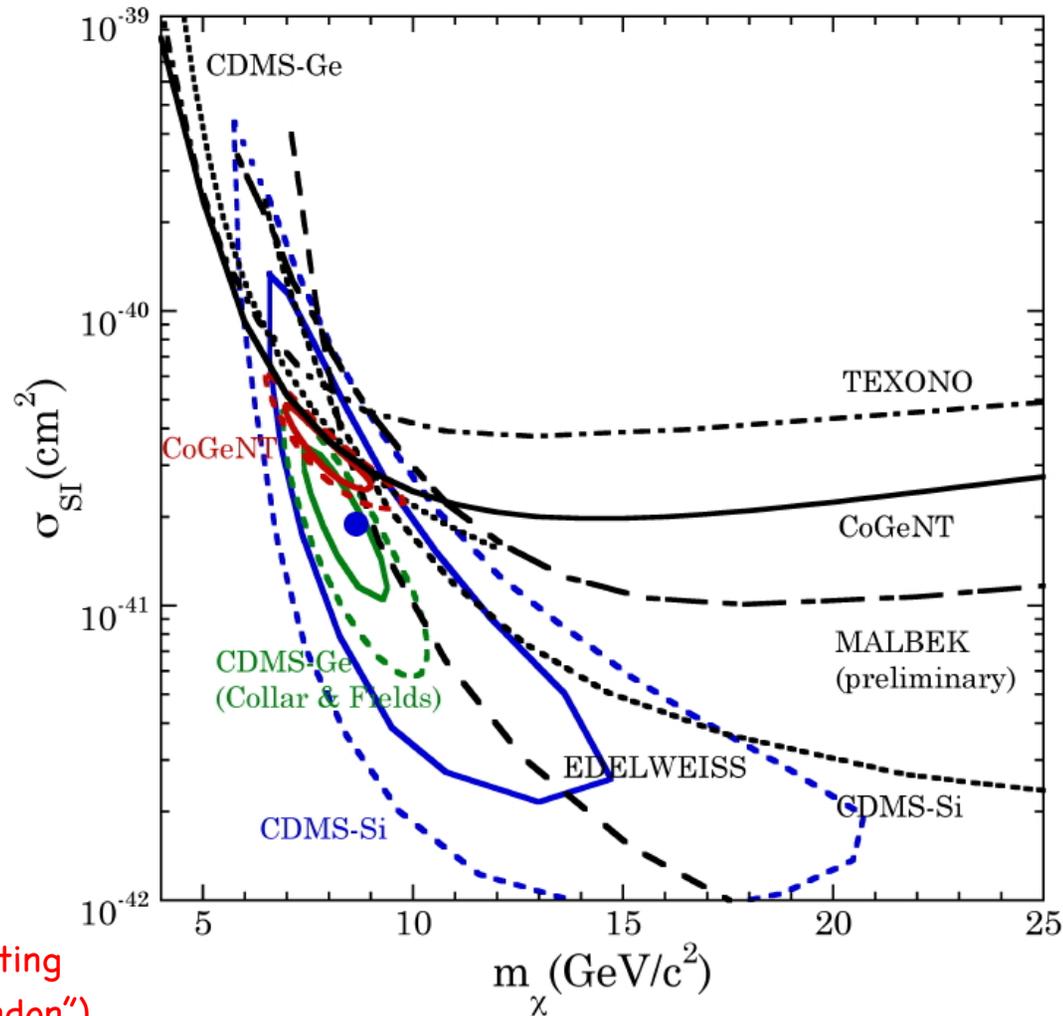
**The side of me that wants to believe**

# A story better told in pictures



The side of me that wants to believe

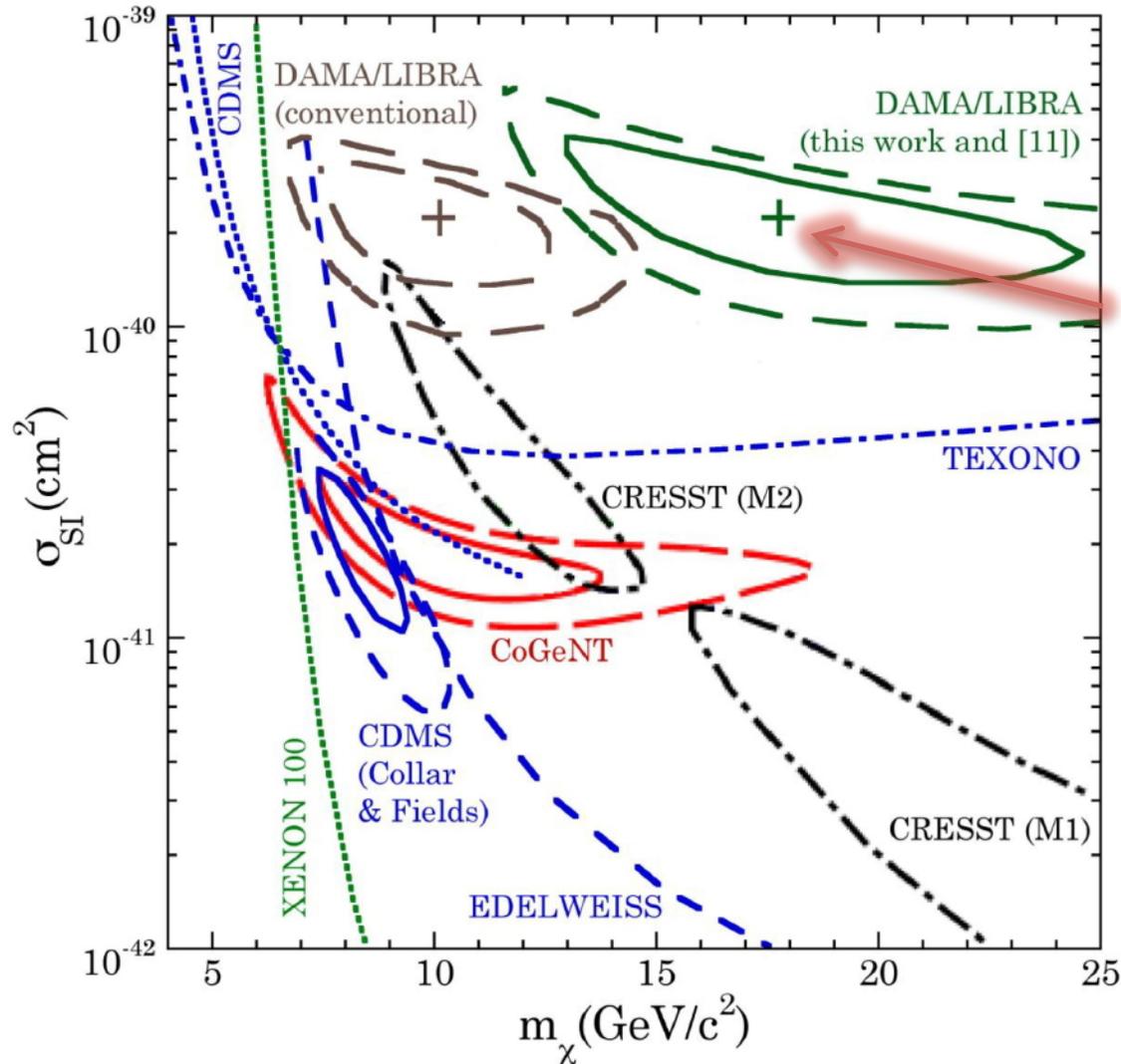
# A story better told in pictures



Exciting!  
(unless this is a sighting  
of the infamous "Fundon")

The side of me that wants to believe

# A story better told in pictures



What I would like to emphasize today

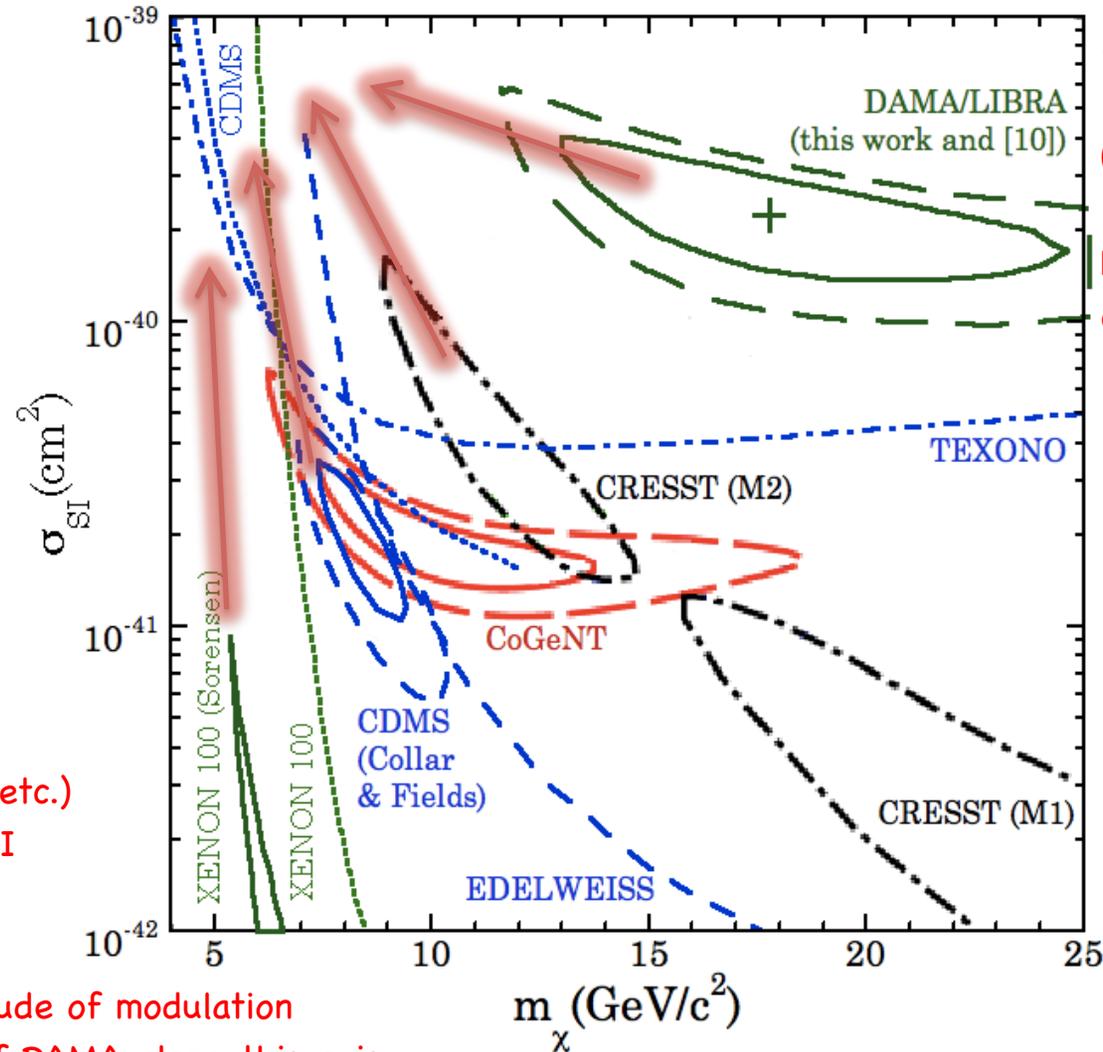
(my own work in trying to understand NaI[Tl] response)

arXiv:1302.0796

arXiv:1303.2686

The side of me that won't let me.

# Reading the tea leaves (receptive audience?)



~ordered from heavy to light target  
(Xe, Ge, (Si), ~Ca, Na)

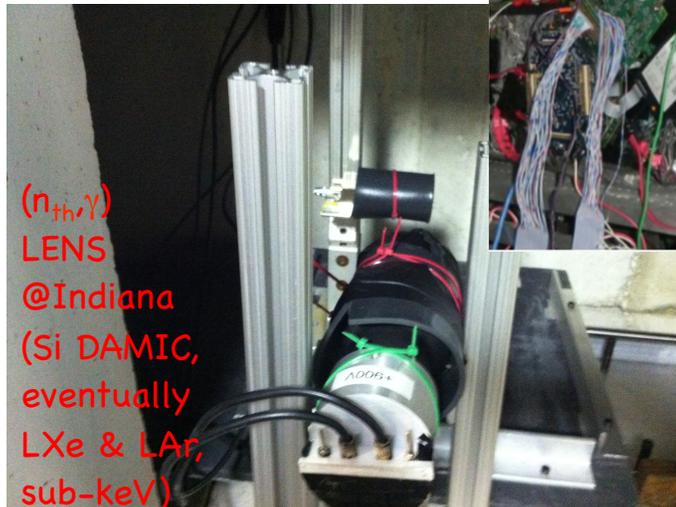
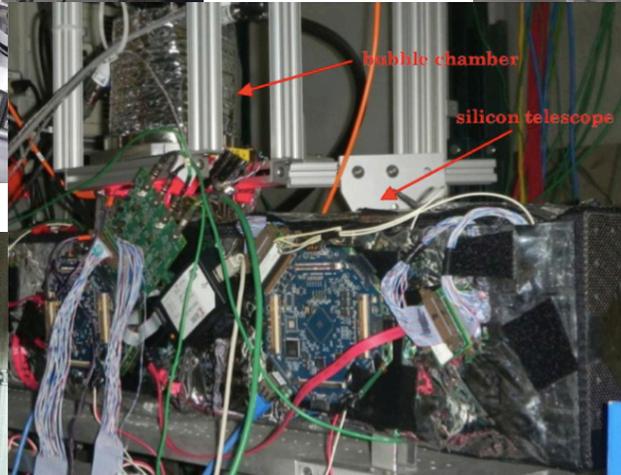
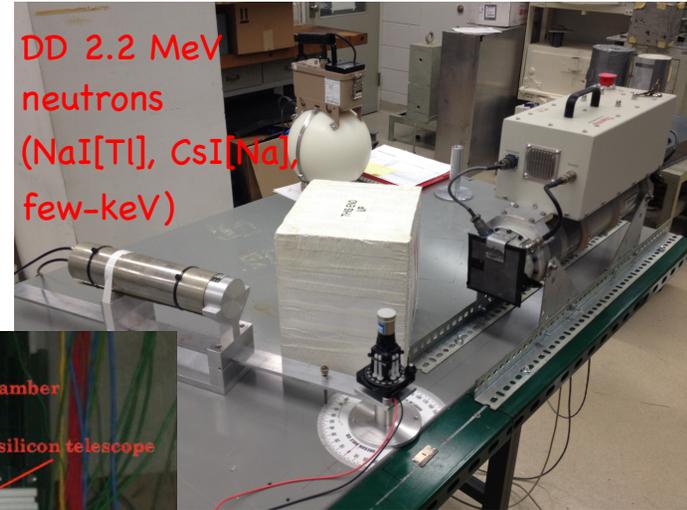
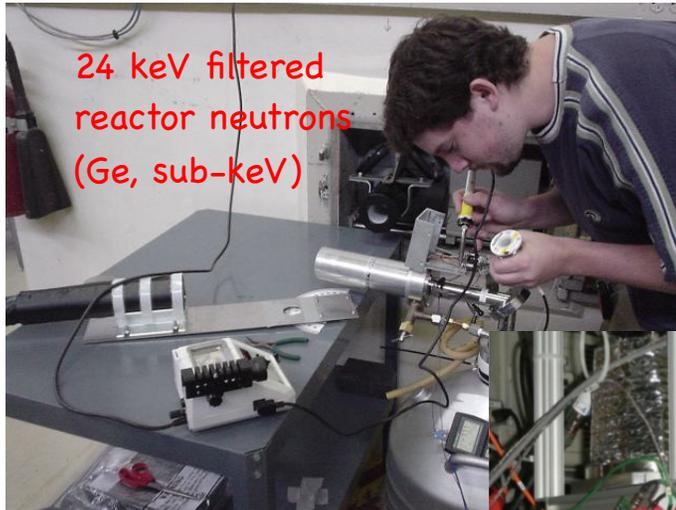
Halo structure?  
Coupling mechanism?

Drop coherence?  
(isospin violating DM, etc.)  
Sorensen's XENON ROI  
could easily be  
X 10 higher, or more.

Also, assumed magnitude of modulation  
determines position of DAMA along this axis.

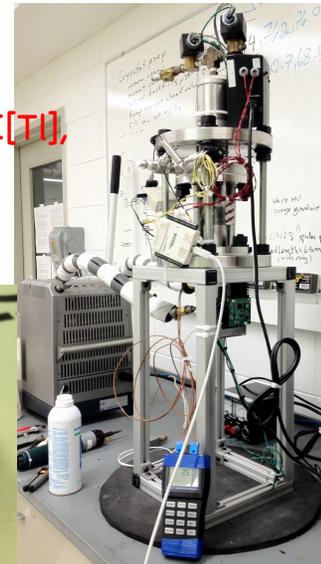
**A map of anomalies (needs CDMS-Si update).**

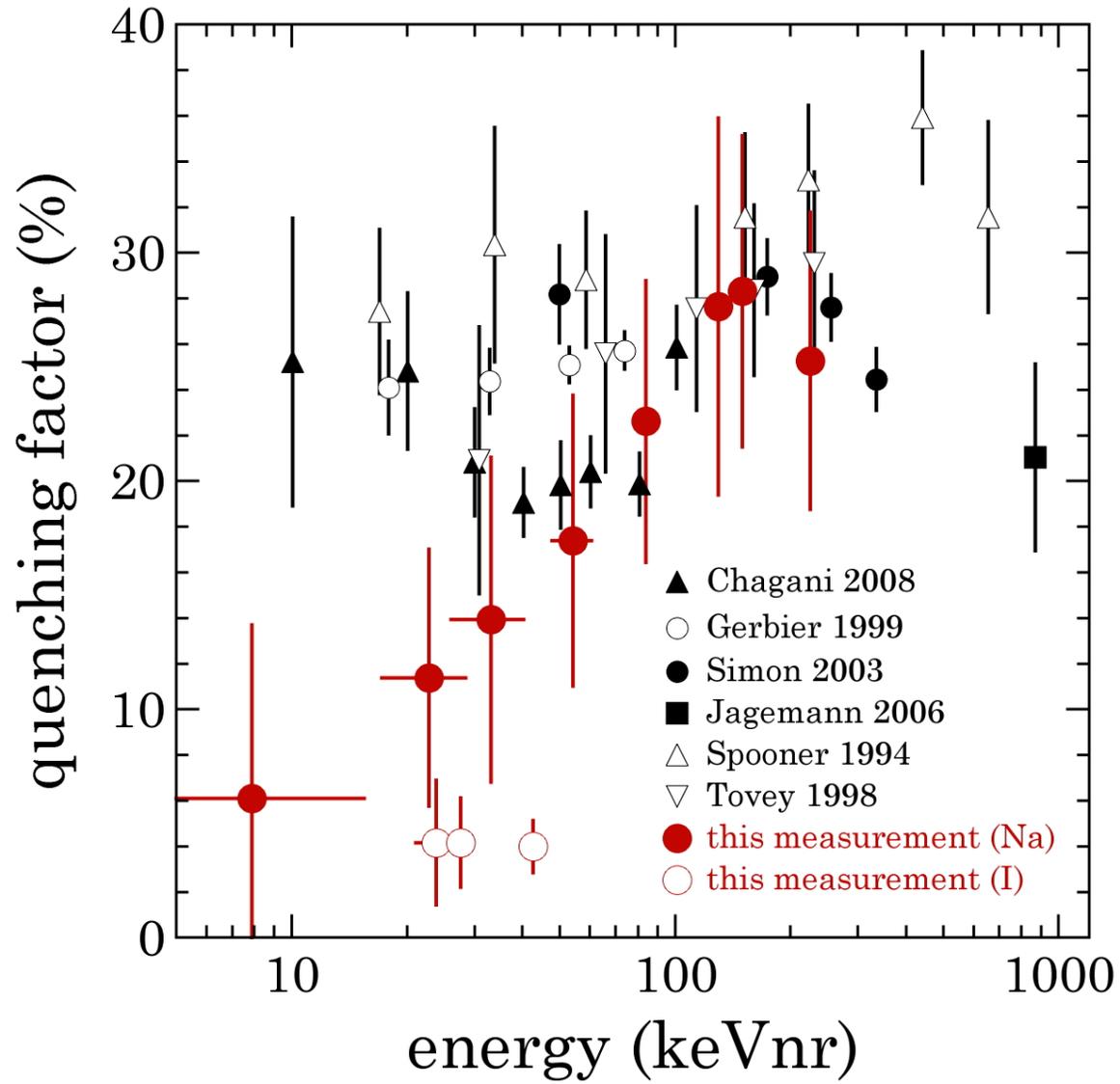
# Calibrations, taken seriously



Y-88/Be  
(Na in NaI[Tl], F in CF3I, few-keV)

Pion scattering  
CIRTE  
(I in CF3I, few-keV)





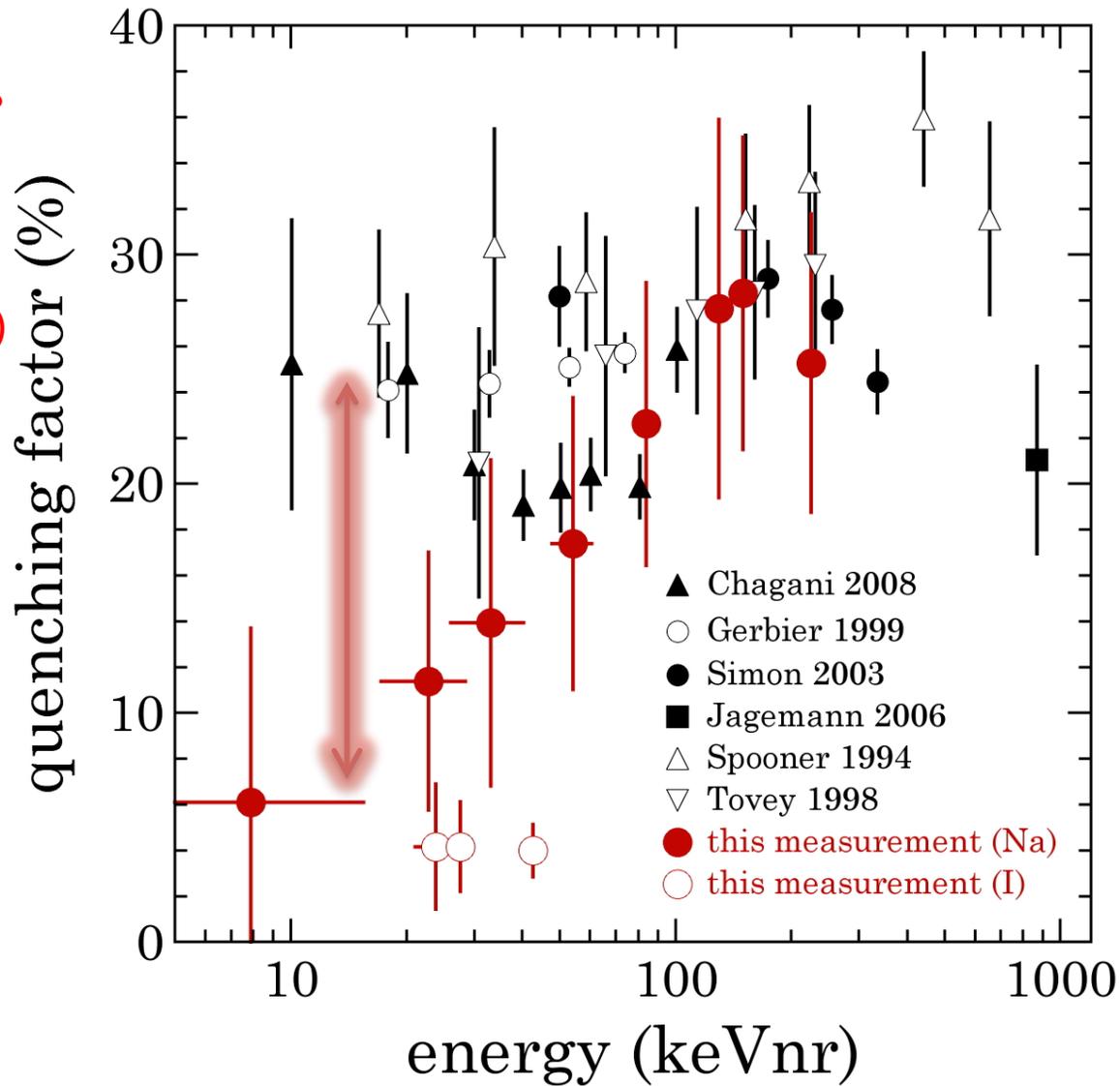
Quo Vadis DAMA?

Why this drop?

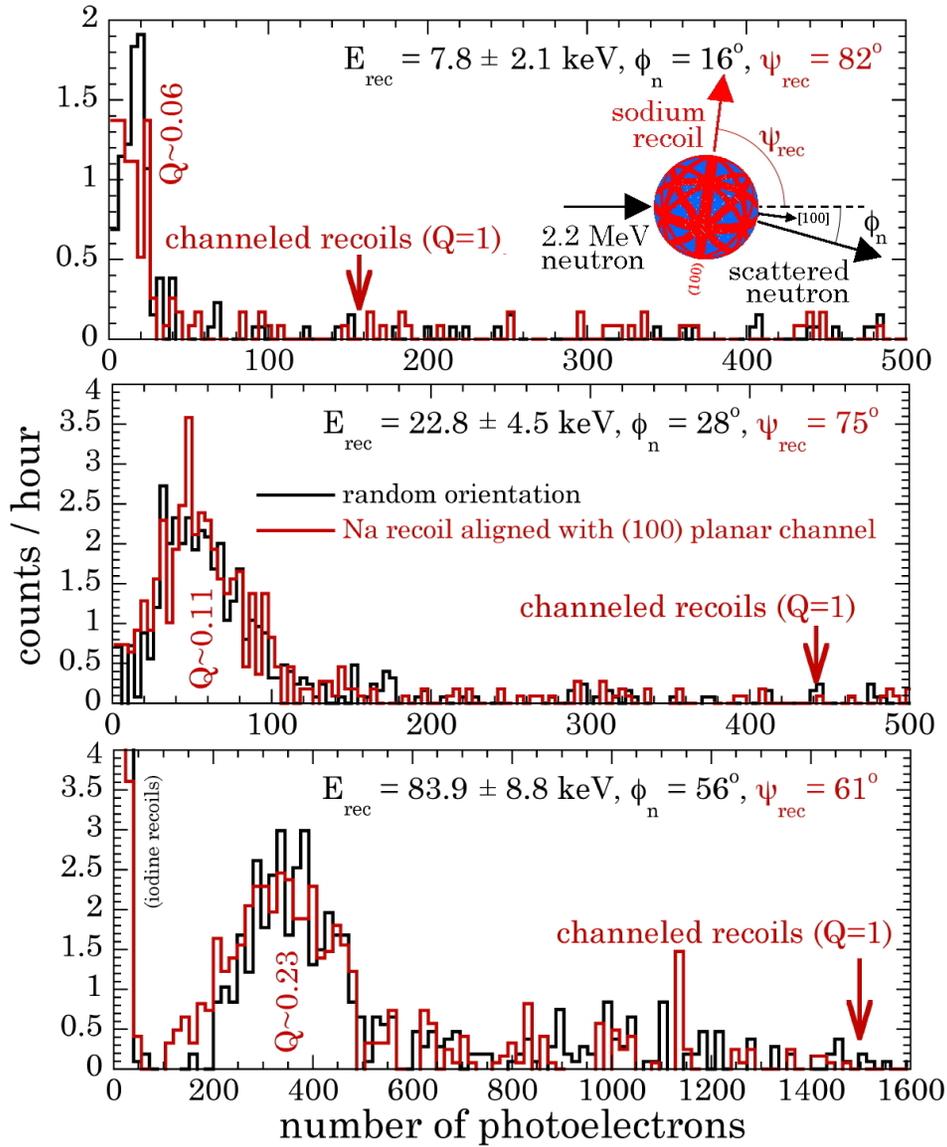
X 4 lower  
threshold  
(x 4 light yield)

ER and NR  
response  
measured  
simultaneously

Several other  
reasons: just  
read the  
goddamned  
paper...



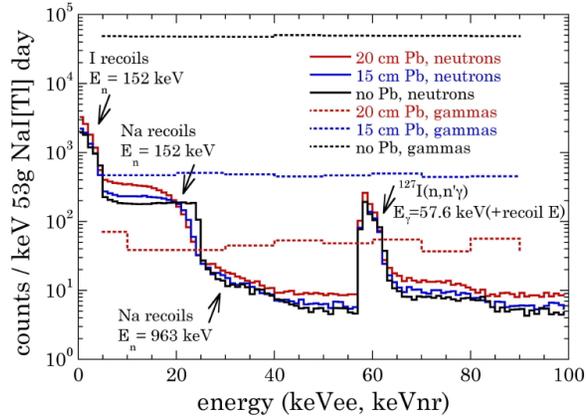
Quo Vadis DAMA?



No evidence for crystal channeling (but some caveats)

Quo Vadis DAMA?

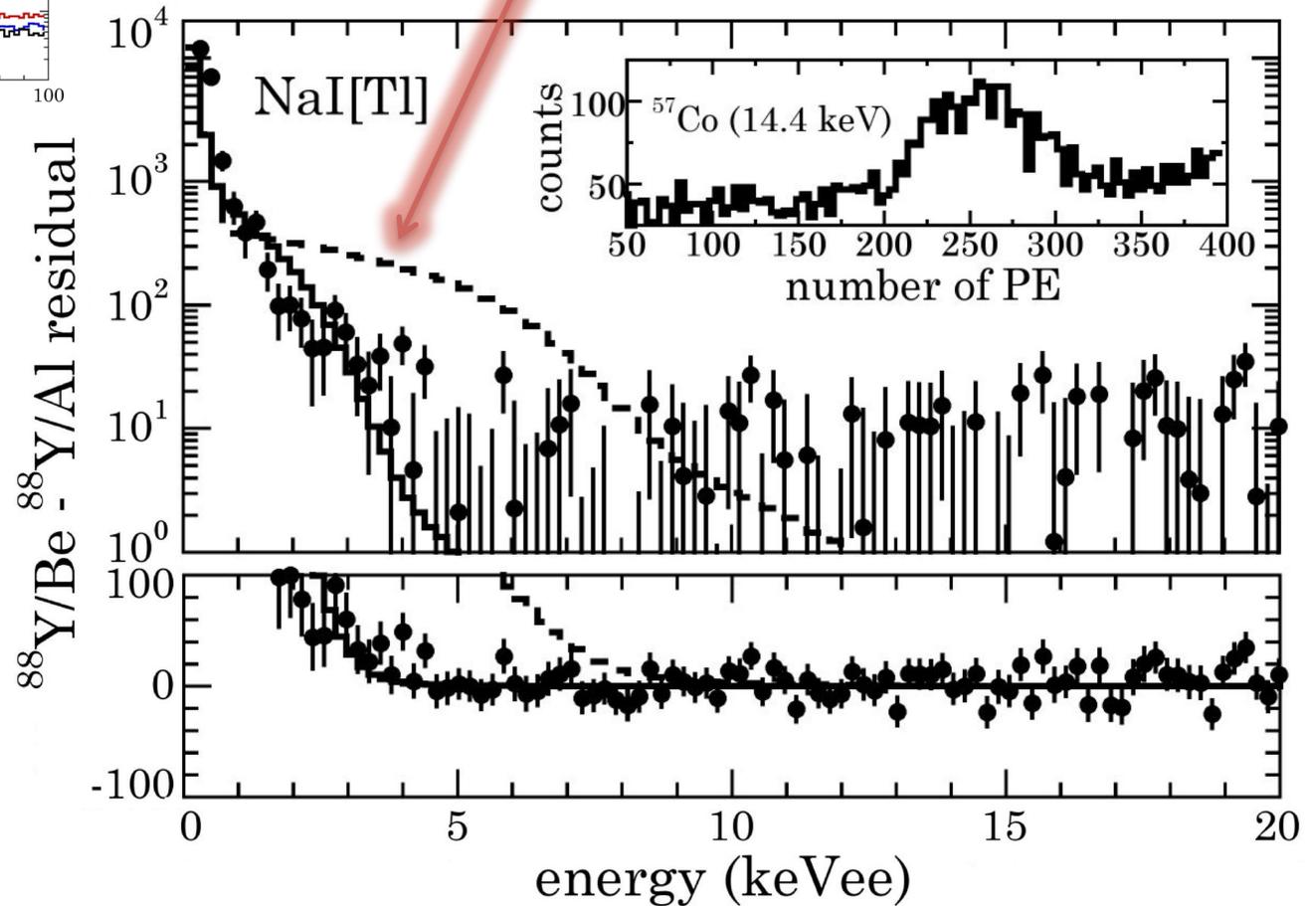
# Double-checking, just in case: arXiv:1303.2686



XENON100, take note:

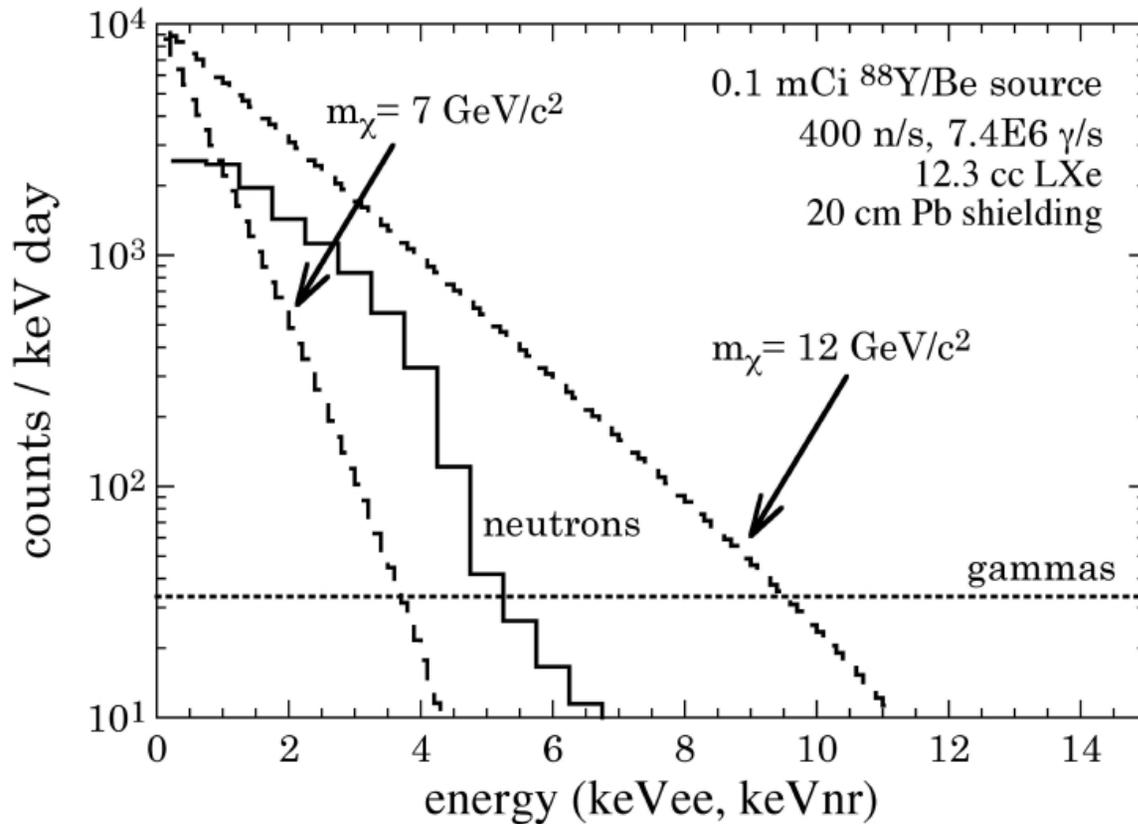
DAMA/LIBRA overestimates their quenching factor  
by a whopping factor of 3, using Am/Be

Y-88/Be  
on  
NaI(Tl)



Quo Vadis DAMA?

# A standing challenge to XENON100:



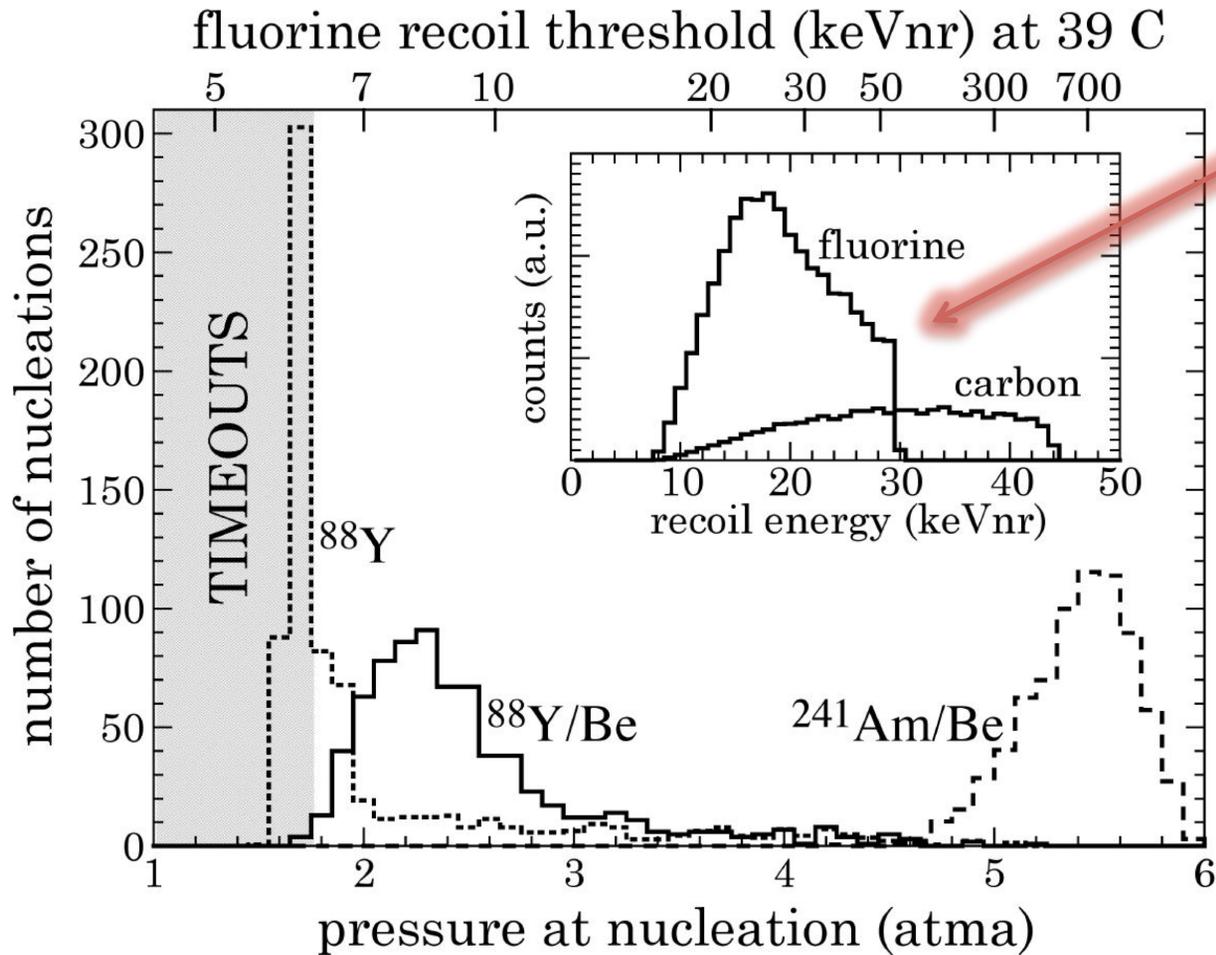
Test your detector with an Y-88/Be source and put us all out of our misery...

(or start retracting your limits, whichever will be)

Grand sum of equipment required to do this



(a dose of our own medicine)



Recoil energies  
probed in this  
calibration

Upcoming COUPP  
results will have  
a very modest  
uncertainty in the  
response to low-E  
recoils.

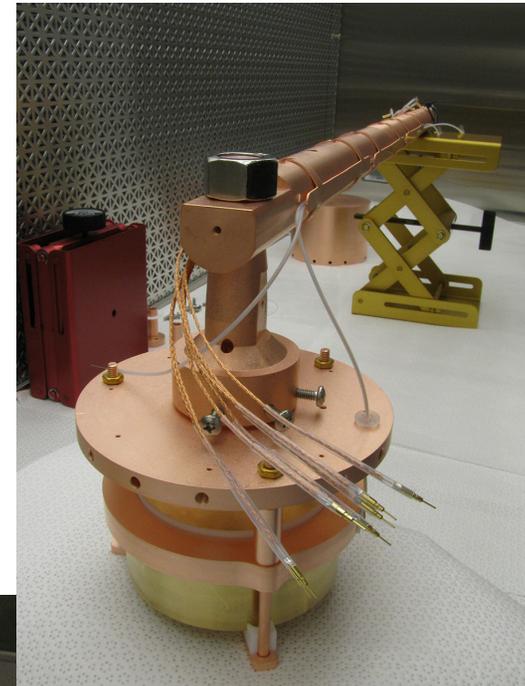
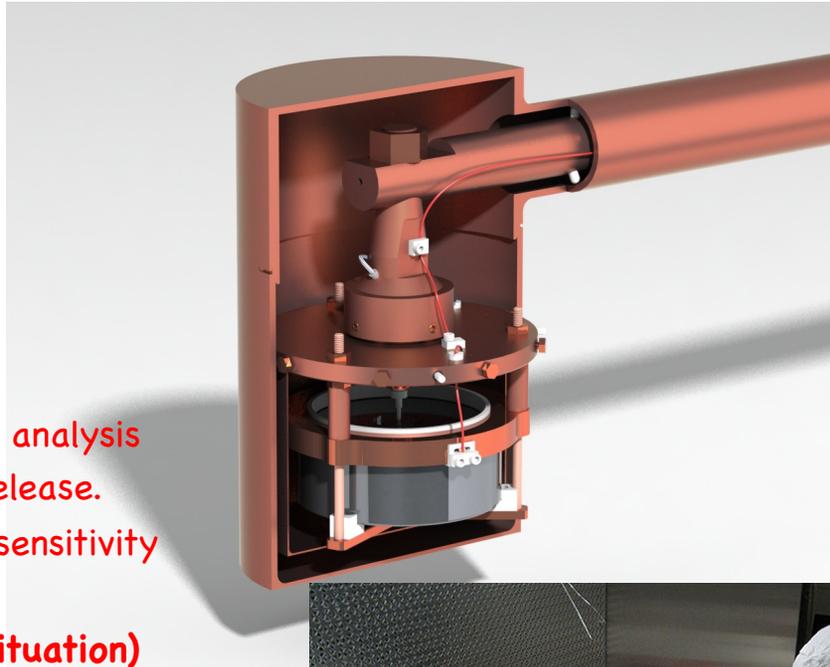
Y-88/Be on CF3I

# Over the horizon in 2013

CoGeNT:

- >3-year analysis and data release.  
Additional sensitivity guaranteed  
**(win-win situation)**

- First C-4 detector to be installed  
(x3 crystal mass, lower threshold and bckg)  
See arXiv:1210.6282

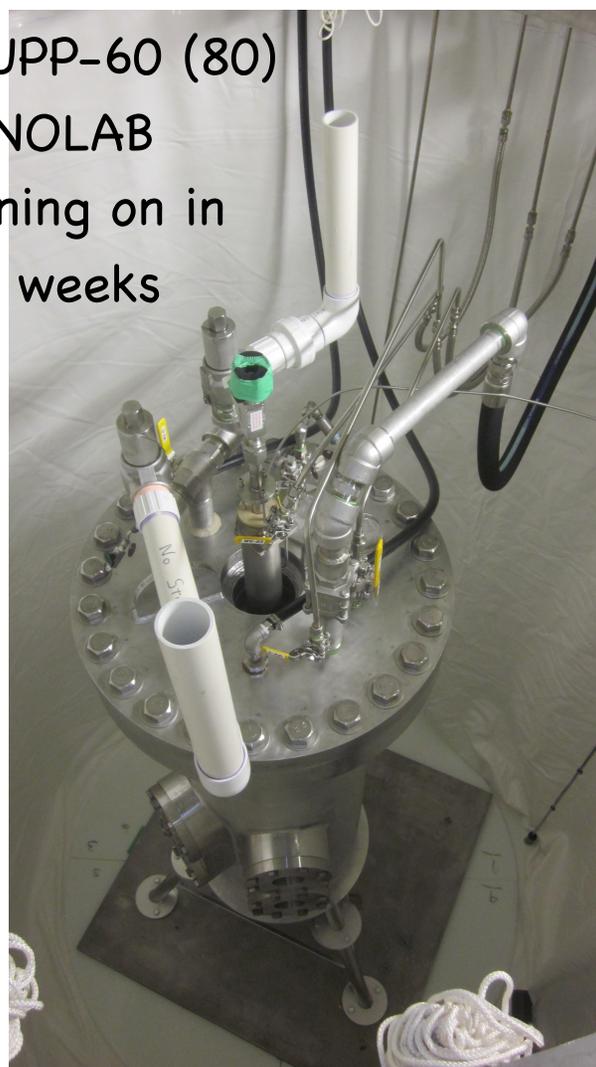


The year we settle the light-WIMP/DAMA issue

# Over the horizon in 2013



COUPP-60 (80)  
@SNOLAB  
Turning on in  
2-3 weeks



Low-energy response for both I and F recoils  
*has been characterized (no uncertainties)*

## The two things I believe in, as of today:

\* DAMA/LIBRA sits very far away in parameter space from other anomalies, under the standard set of assumptions. Much more excluded than before, under those same assumptions. If we remove DAMA/LIBRA as a prior, what are we left with?

\* XENON10, XENON100 has come nowhere close to demonstrating sensitivity to a  $\sim 8$  GeV WIMP.

But they can, if they so desire (Y-88/Be calibration, *in situ* <-important!).