9TH INTERNATIONAL CONFERENCE

JULY 23 - 27, 2012 • CHICAGO, USA

Summary talk - G. Bertone

IDENTIFICATION OF
DARK MATTER

IDM 2012
CHICAGO

INTERNATIONAL CONFERENCE

IDENTIFICATION OF DARK MATTER

CHICAGO
JULY 23-27

IDM 2012

180 participants
30 plenary talks
12 parallel sessions
120 presentations
~5000 slides

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K. Abazajian holds the record: 88 slides in 25 mins!

INTERNATIONAL CONFERENCE

CHICAGO
JULY 23-27

IDENTIFICATION OF
DARK MATTER

IDM 2012

Can't possibly do justice in 25 mins to the great quality and diversity of presentations!

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R. Kolb

" 25 years of searching and still no discovery. Does that give you the "*Dark Matter Blues*?"

INTERNATIONAL CONFERENCE

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CHICAGO
JULY 23-27

IDM 2012

Highlights of IDM 2012
in 10 Classic Blues Songs

1: Pride and Joy

Stevie Ray Vaughan

1: Pride and Joy

Stevie Ray Vaughan

D. Hooper

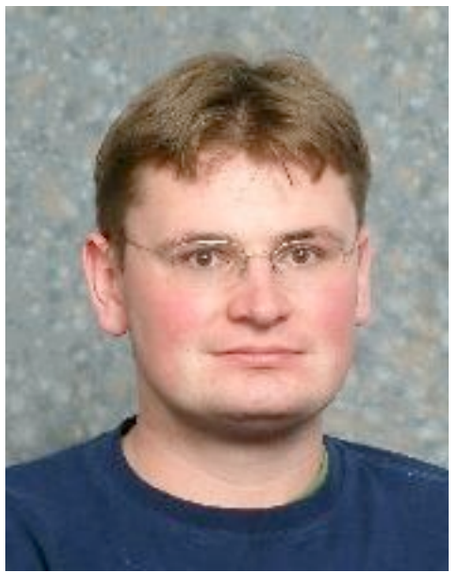
"We are entering the era of discovery [...]. We are finally reaching the sensitivity to probe the most interesting candidates."

2: As The Years Go Passing By

Gary Moore

2: As The Years Go Passing By

Gary Moore



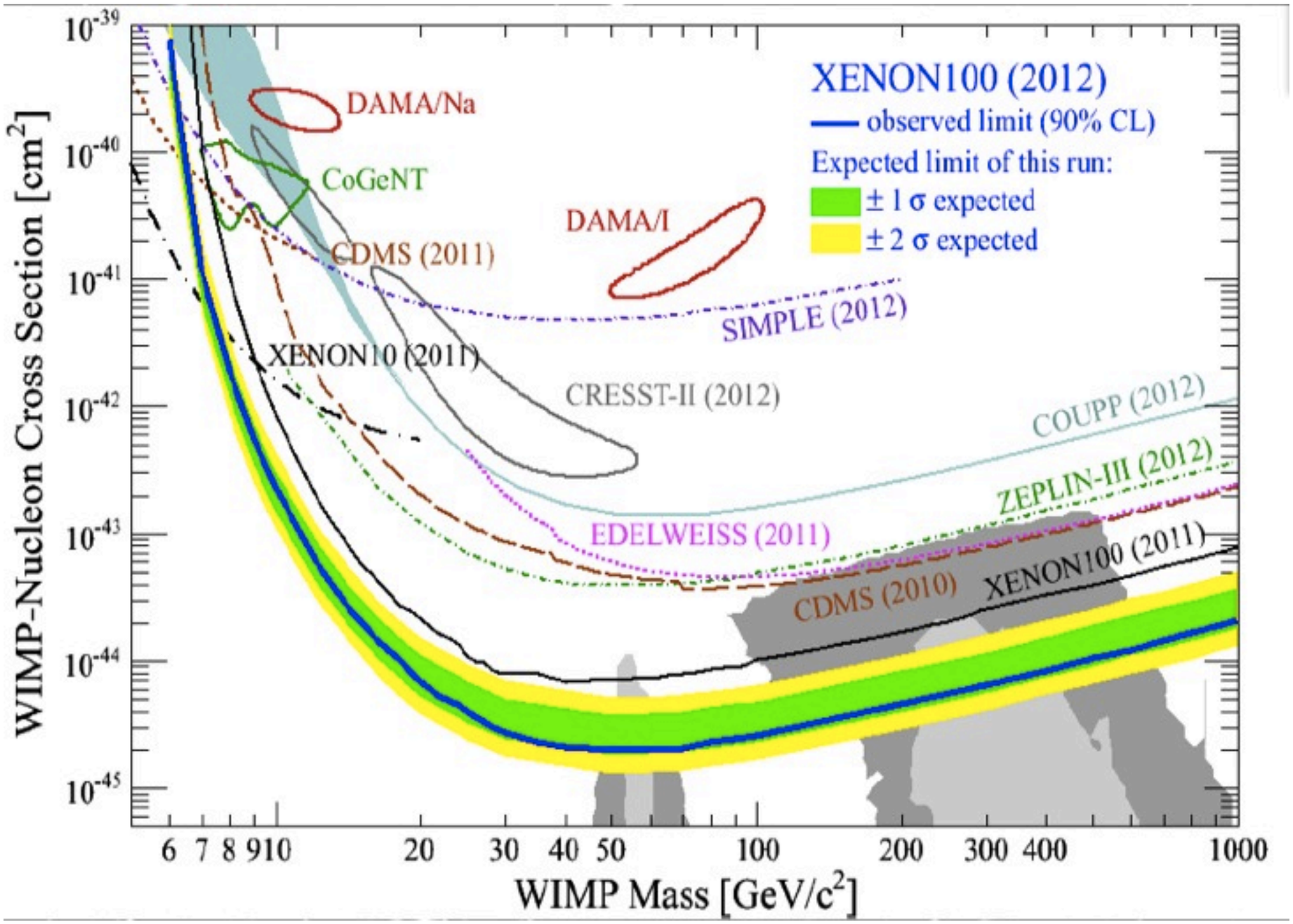
J. Jaeckel

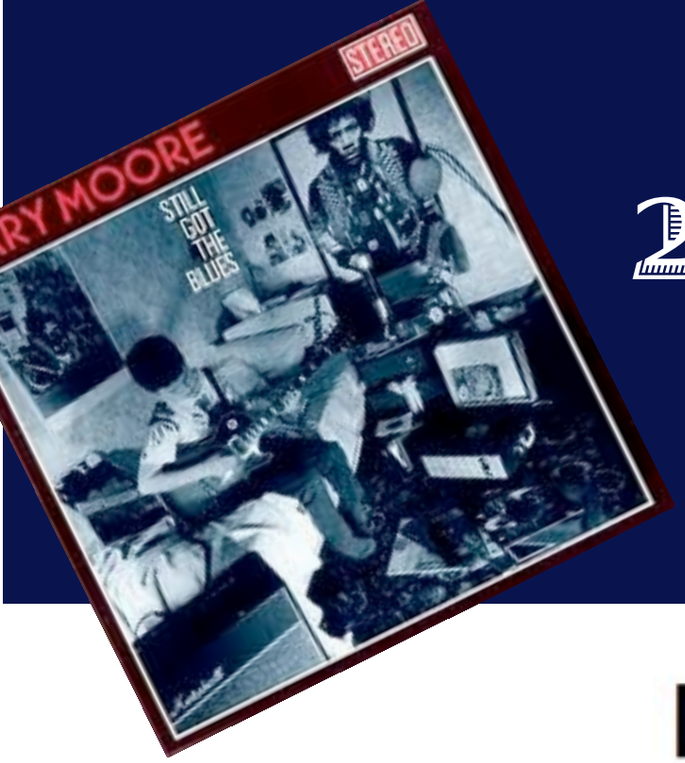
NO SIGNAL ABOVE BACKGROUND!

2: As The Years Go Passing By

Gary Moore

New results
Xenon 100
A. J. Melgarejo

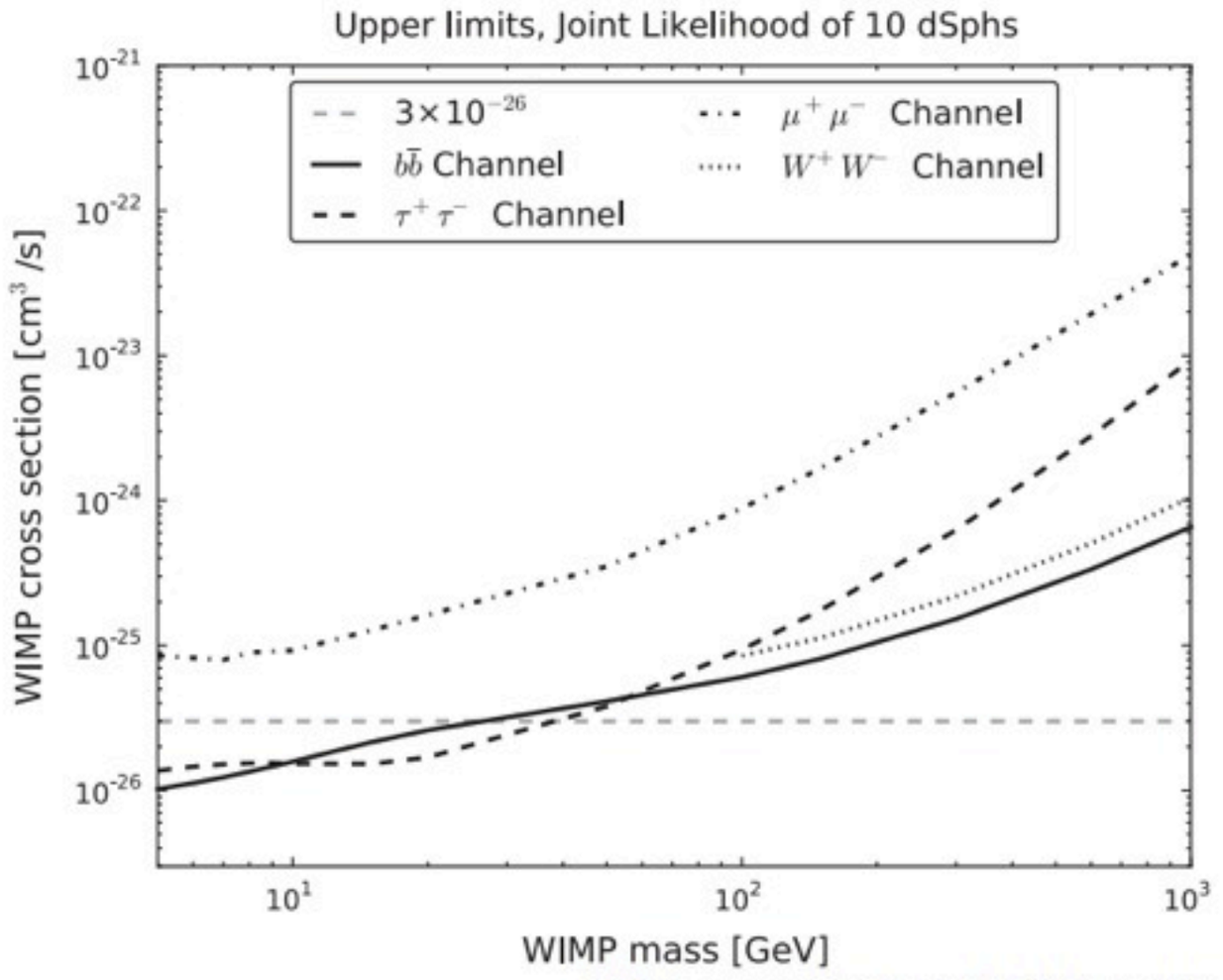




2: As The Years Go Passing By

Gary Moore

DM limits from combined analysis of dSphs



M. Ackermann et al. [Fermi LAT Collaboration], PRL 107, 241302 (2011)

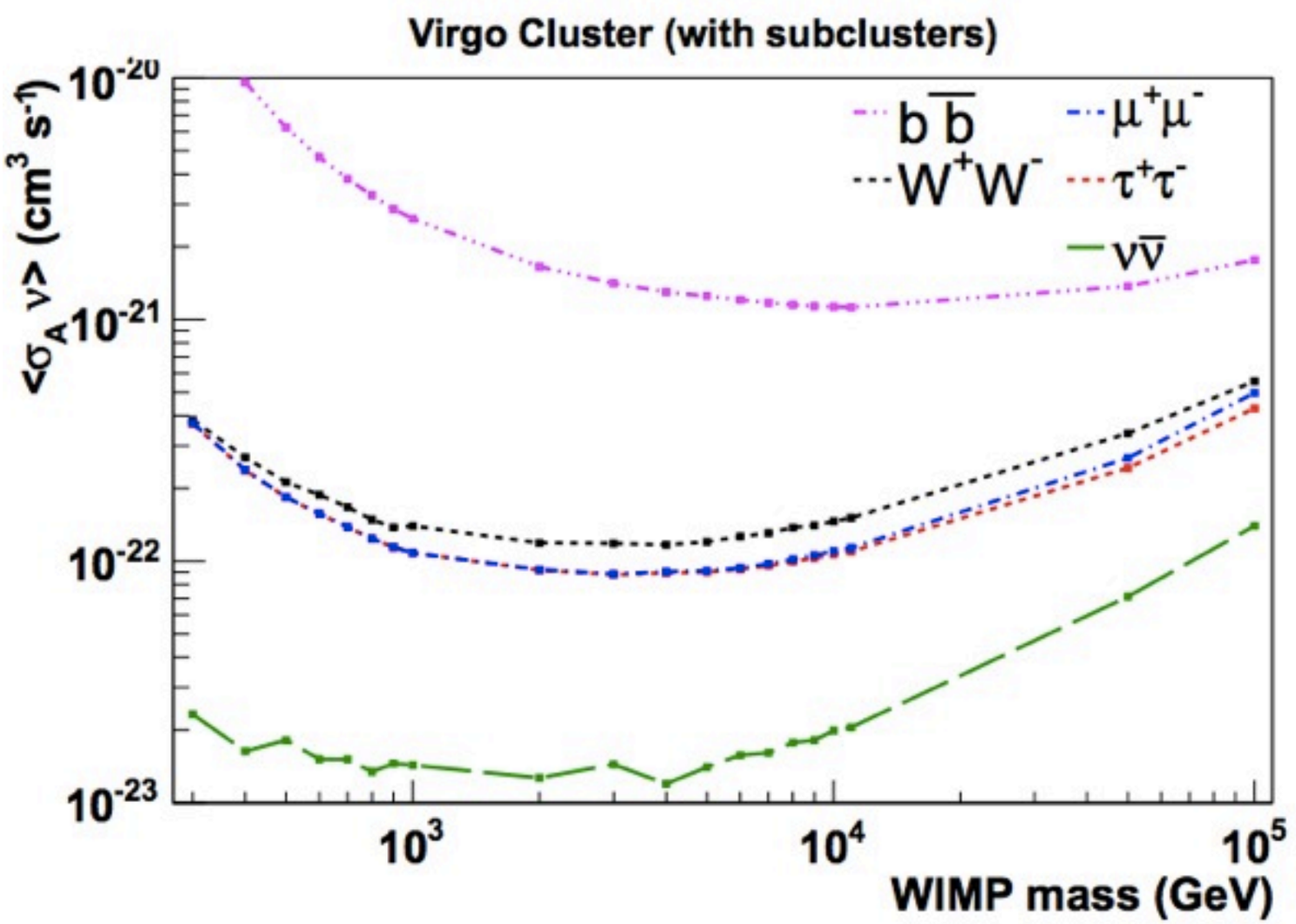
J. Siegal-Gaskins

2: As The Years Go Passing By

Gary Moore

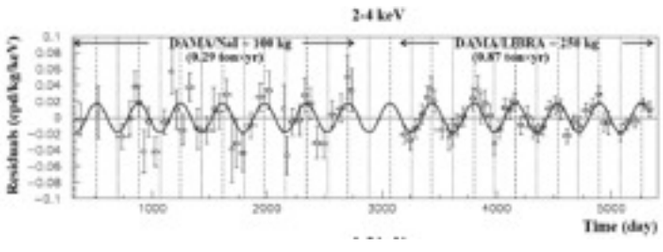
IceCube RESULTS (!!)

C. Rott



3: I'm in the mood

John Lee Hooker



R. Cerulli

DAMA/Libra annual modulation
(new results on muons)

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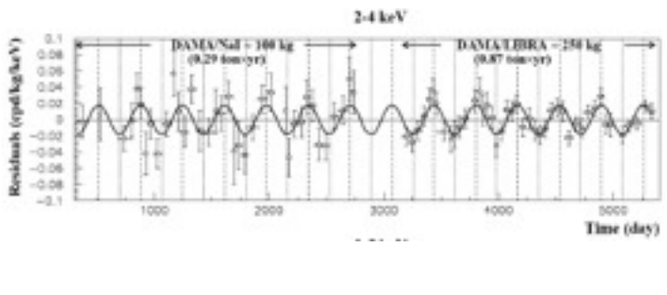
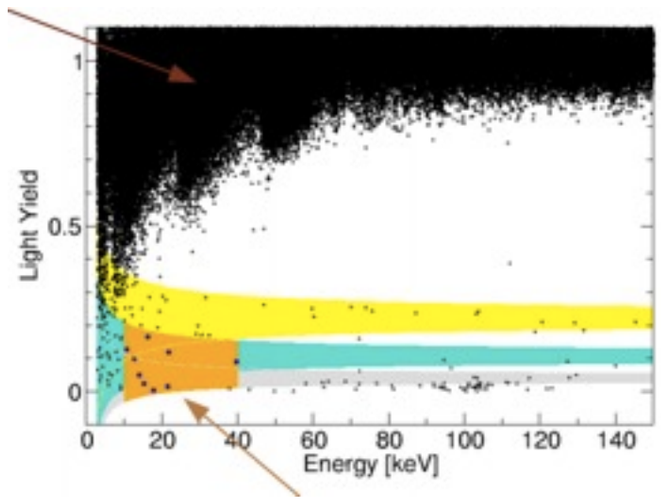
John Lee Hooker





R. Cerulli

DAMA/Libra annual modulation
(new results on muons)

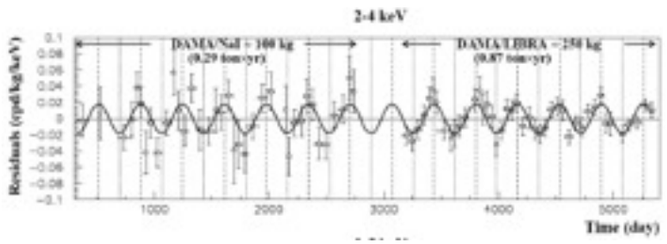
C. Strandhagen

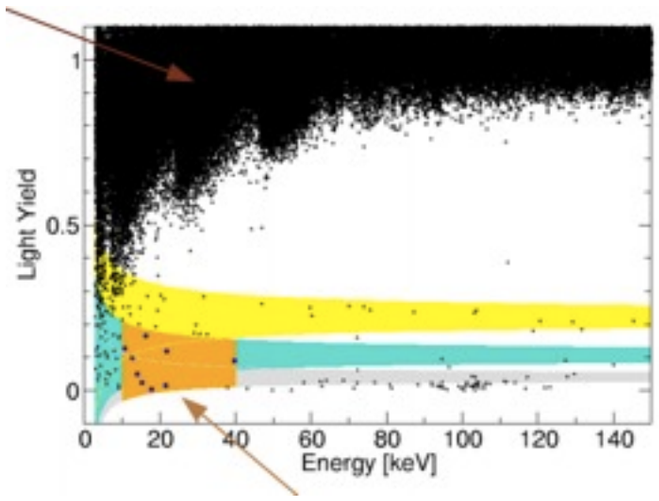
CRESST: 8 CaWO4 modules,
730 kg days, 67 events.

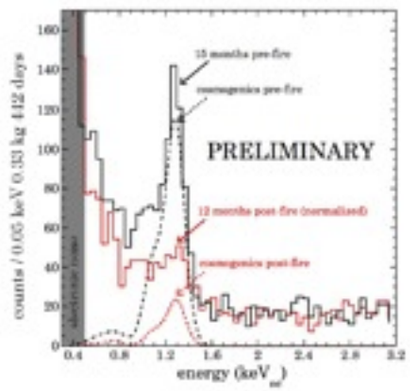
Likelihood analysis: background-only hypothesis rejected with high statistical significance

3: I'm in the mood

John Lee Hooker







R. Cerulli

DAMA/Libra annual modulation
(new results on muons)

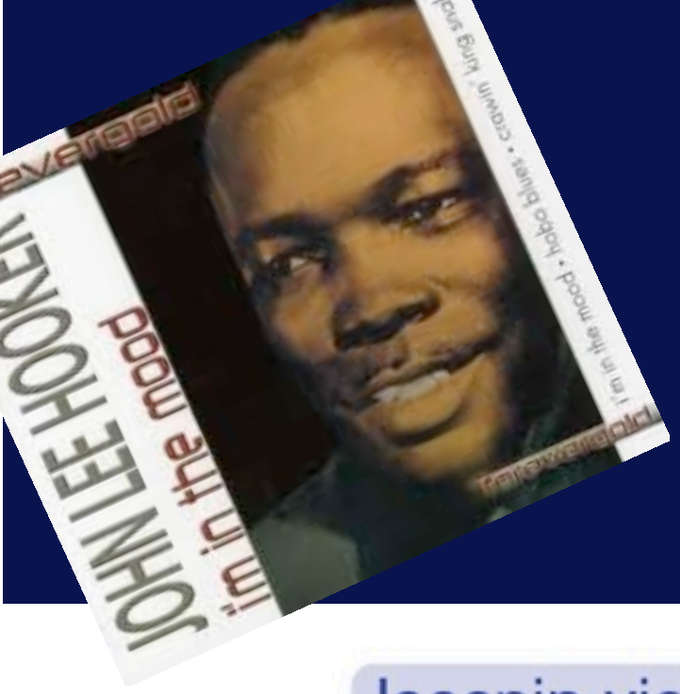
C. Strandhagen

CRESST: 8 CaWO4 modules, 730 kg days, 67 events.

Likelihood analysis: background-only hypothesis rejected with high statistical significance

J. Collar

"Rates look flatter on second year. Optimist: to be expected, the modulation was too large. Pessimist: to be expected, the modulation was a fluke."

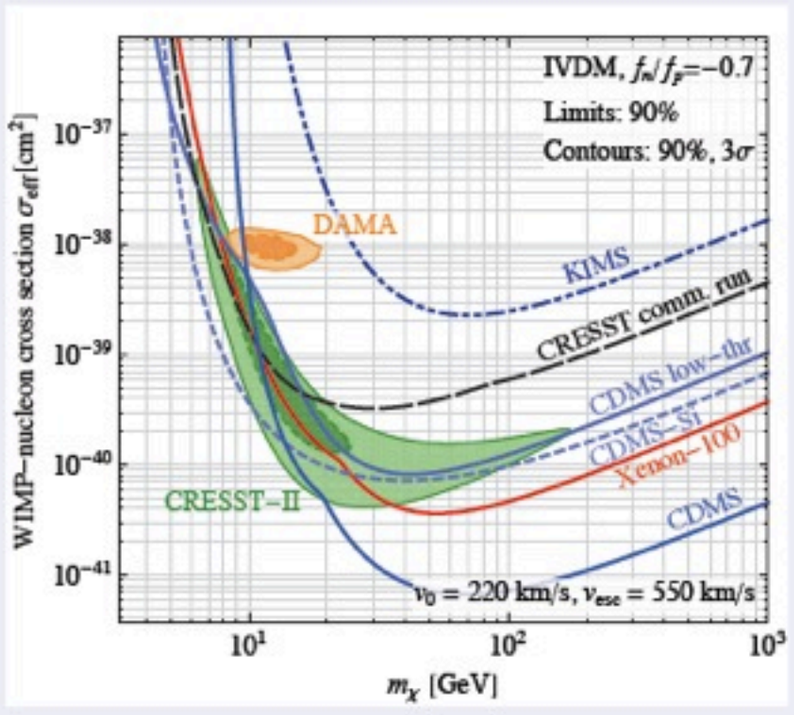


3: I'm in the mood

John Lee Hooker

Isospin-violating DM Feng Kumar Marfatia Sanford 1102.4331

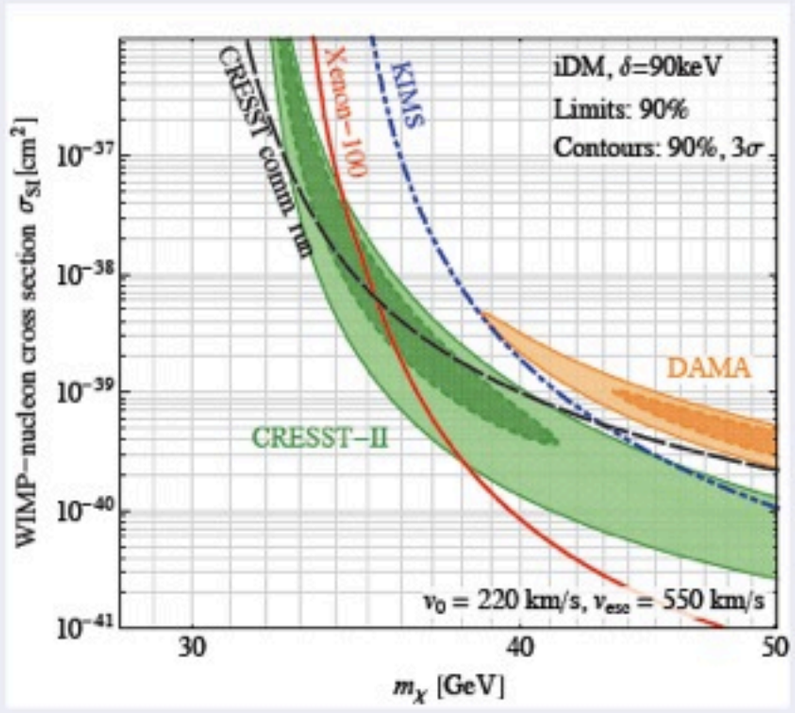
Different couplings to protons and neutrons
→ "switch off" xenon



Plot: JK Schwetz Zupan 1110.2721

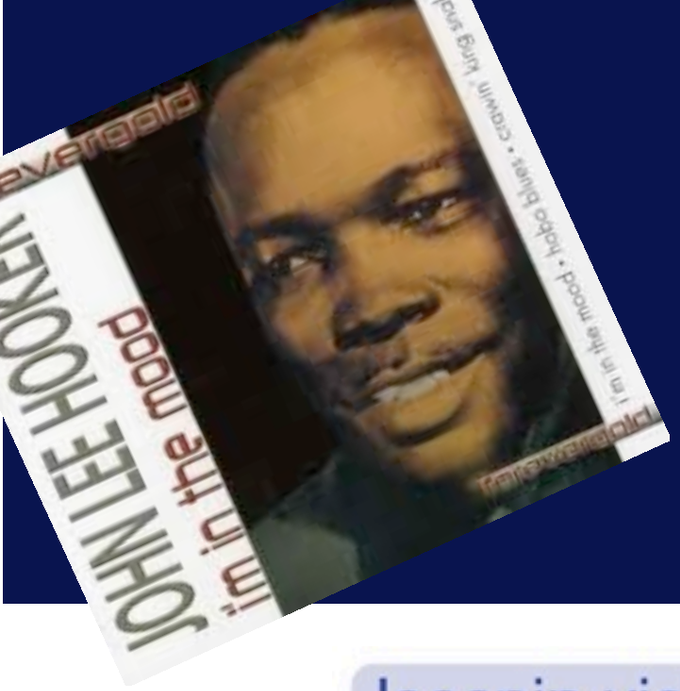
Inelastic DM Tucker-Smith Weiner hep-ph/0101138

Inelastic scattering
→ prefers heavy targets (CRESST!)



Plot: JK Schwetz Zupan 1110.2721

J. Kopp

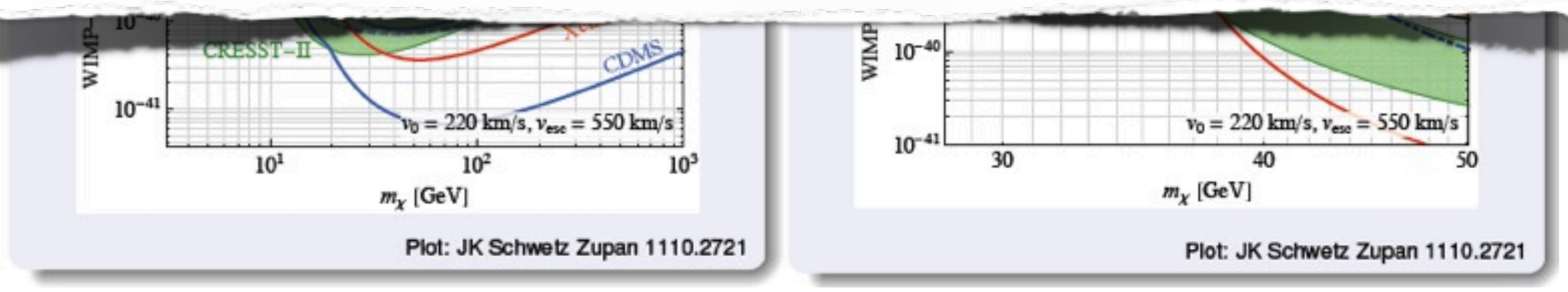


3: I'm in the mood

John Lee Hooker

"Either we are to learn something subtle about the halo, couplings, or detector effects, or…
their observations have nothing in common."

J.Collar

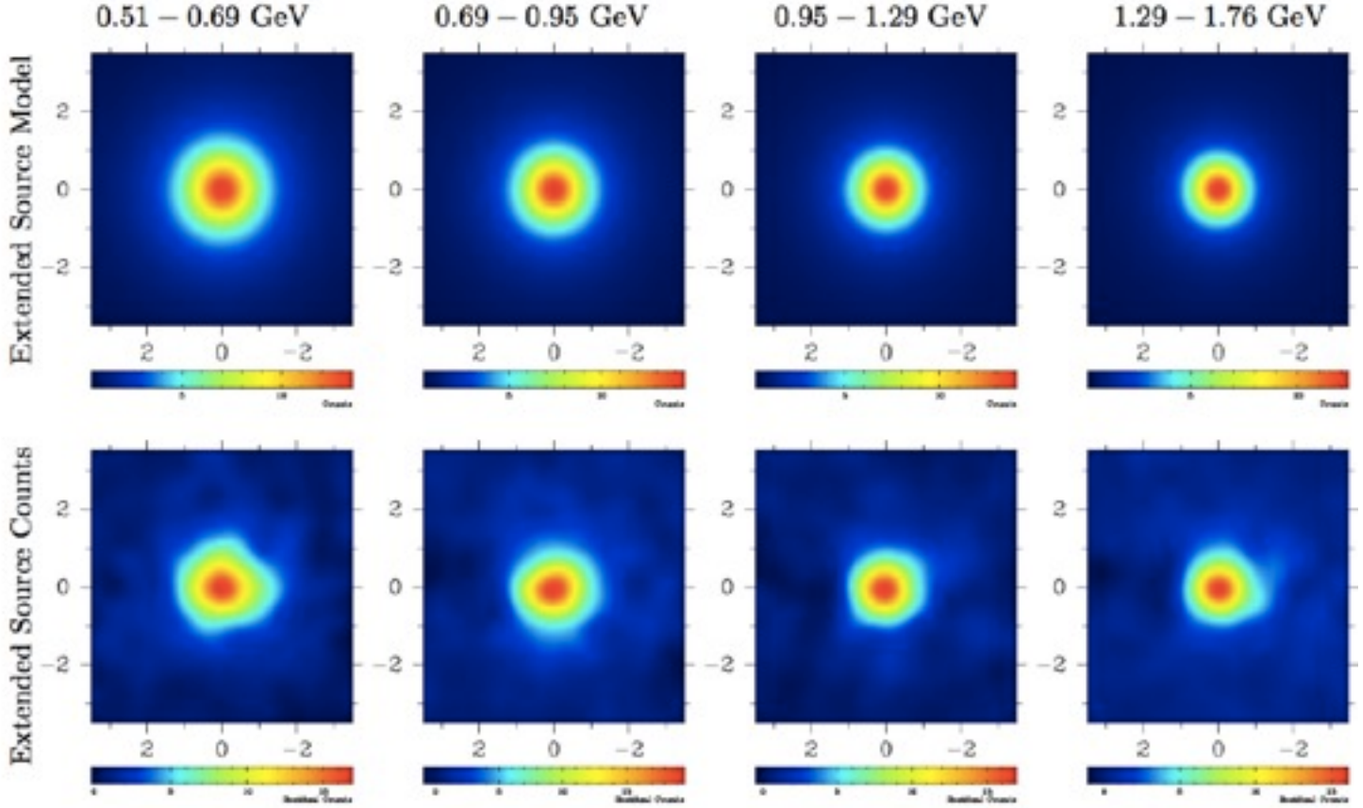


J. Kopp

3: I'm in the mood

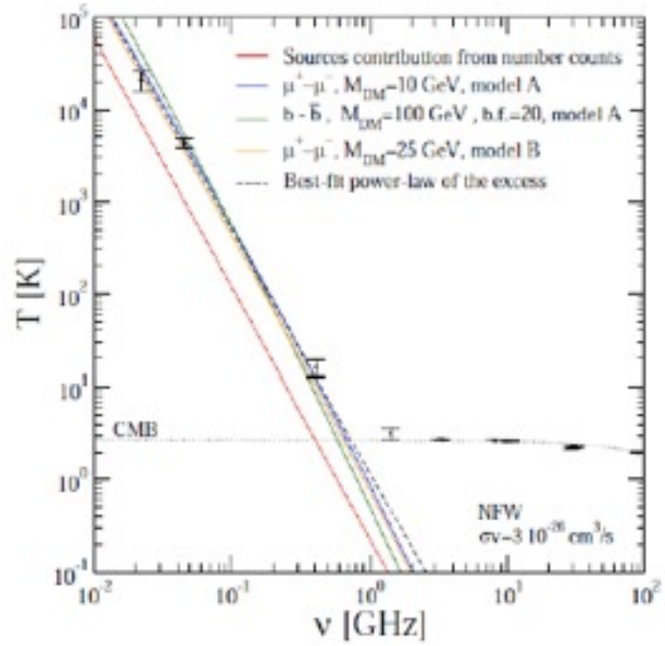
John Lee Hooker

Hints from indirect detection



Gammas from the GC - K. Abazajian

DM interpretation of the ARCADE excess



Radio - M. Taoso

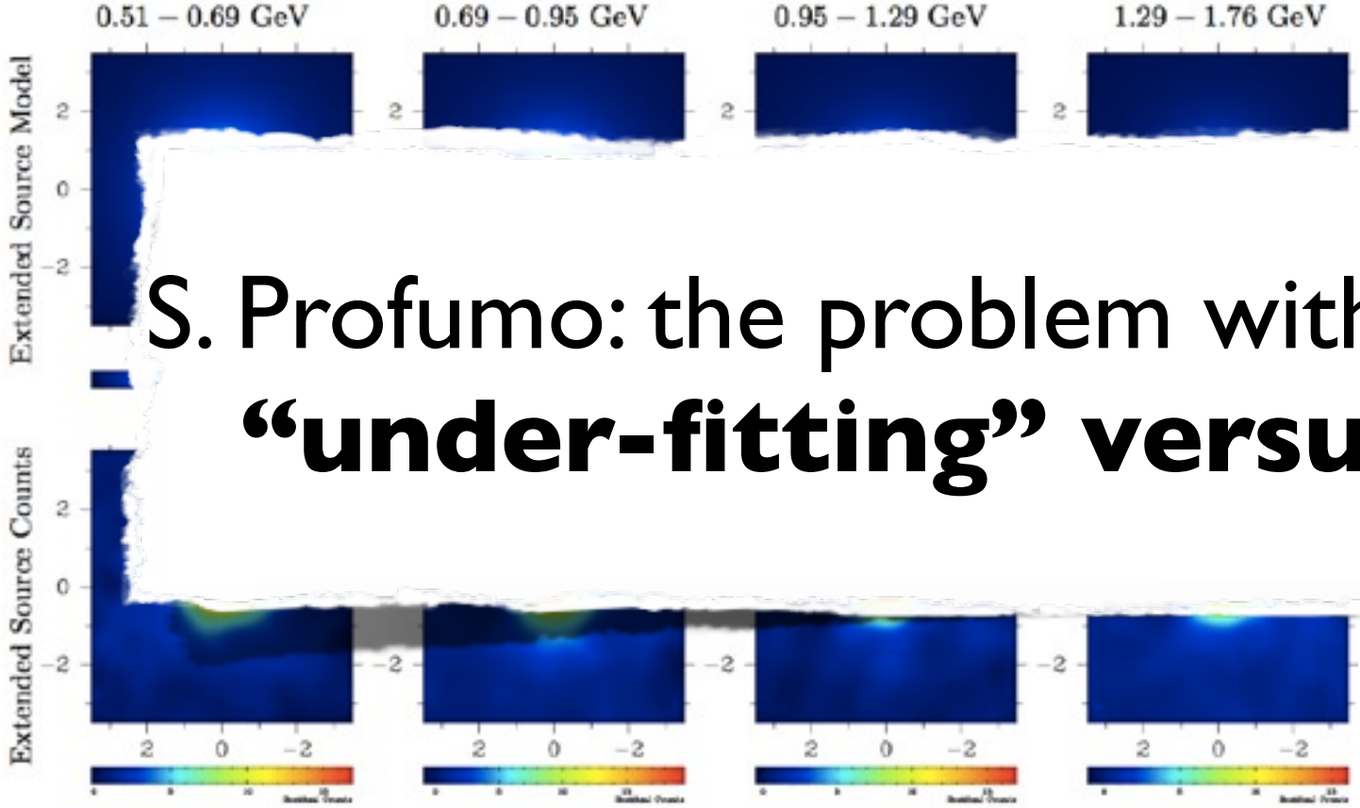
3: I'm in the mood

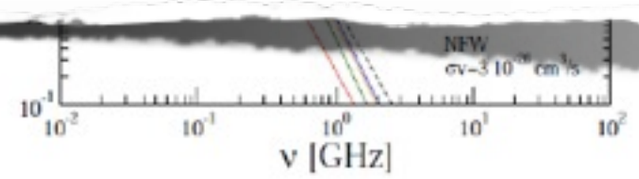
John Lee Hooker

Hints from indirect detection

DM interpretation of the ARCADE excess

S. Profumo: the problem with the Galactic Center:
"under-fitting" versus "over-fitting"





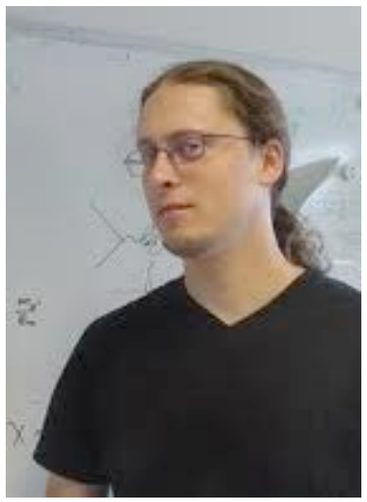
Gammas from the GC - K. Abazajian

Radio - M. Taoso

4: Boom Boom

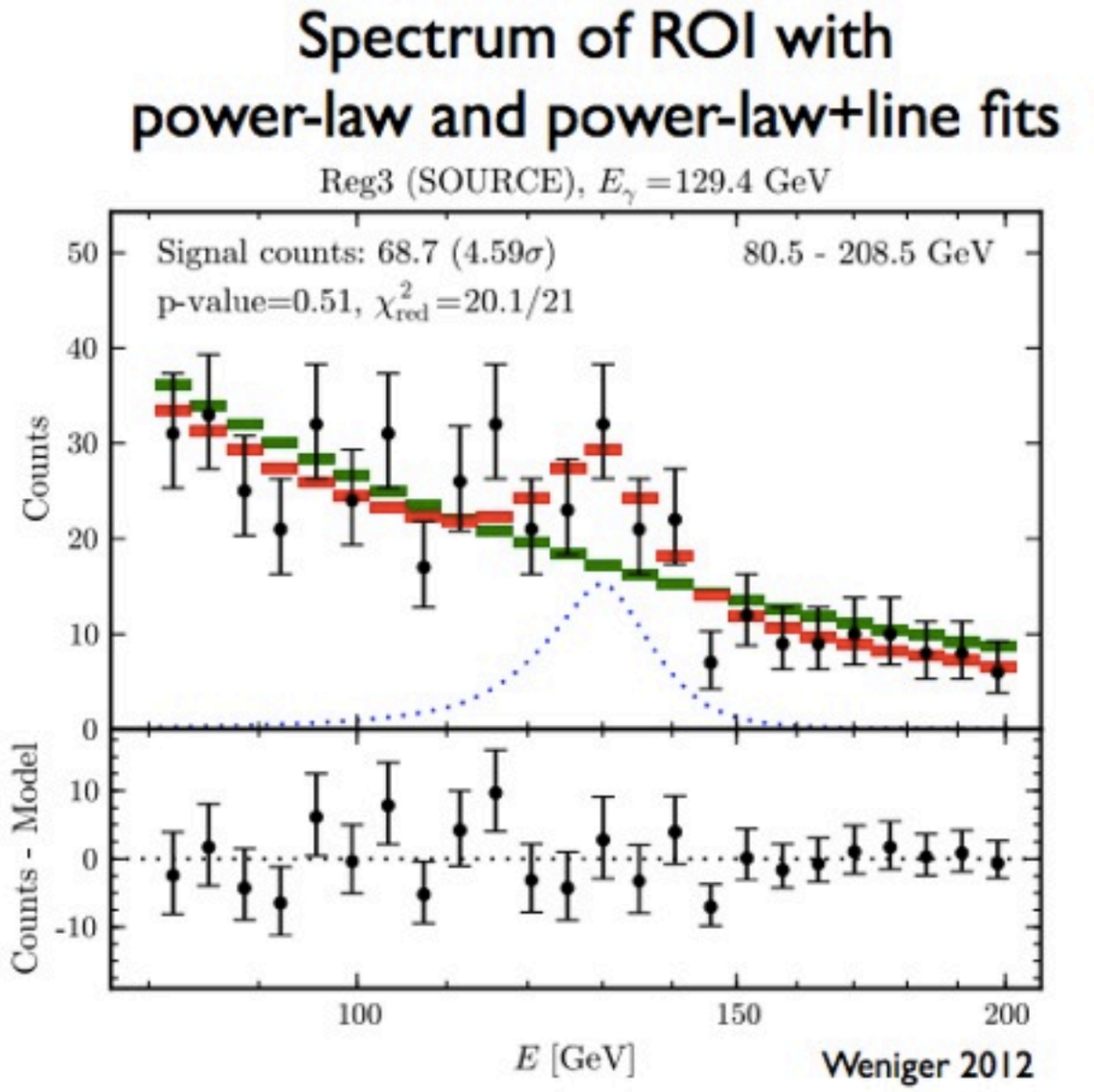
John Lee Hooker

Hints from indirect detection



C. Weniger

see also: Bringmann, Huang, Ibarra, Vogl, Weniger, arXiv: 1203.1312; Weniger, arXiv:1204.2797; Tempel, Hektor, Raidal, arXiv:1205.1045; Boyarsky, Malyshev, Ruchayskiy, arXiv:1205.4700; Geringer-Sameth & Koushiappas, arXiv: 1206.0796; Su & Finkbeiner, arXiv:1206.1616, Aharonian, Khangulyan, Malyshev, arXiv:1207.0458 ...



4: Boom Boom

John Lee Hooker

HESS II

28m HESS-II telescope added to 4 12m telescopes. Nearly operational, will provide very low threshold monoscopic-imaging, some reduction in threshold of HESS 12m telescope array for stereoscopic events.

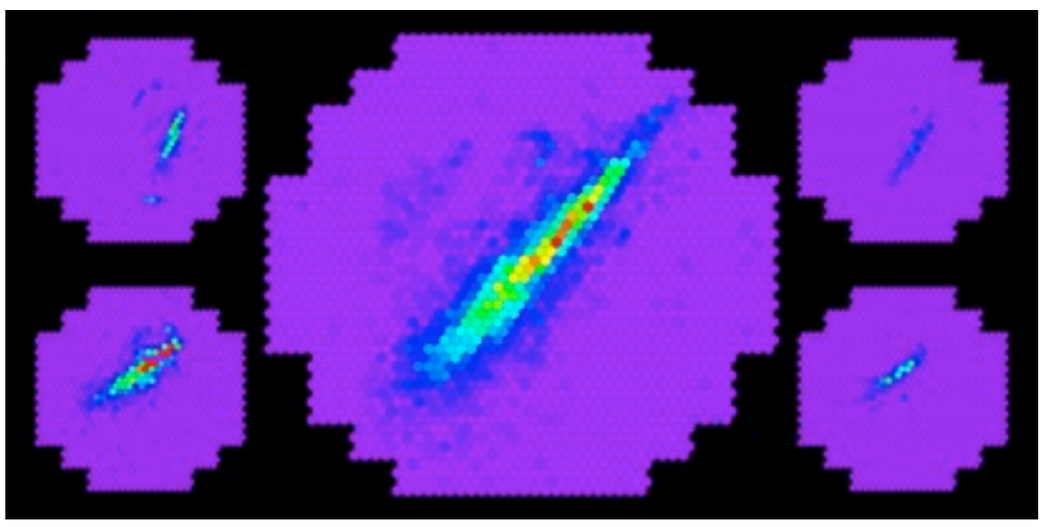
J. Buckley

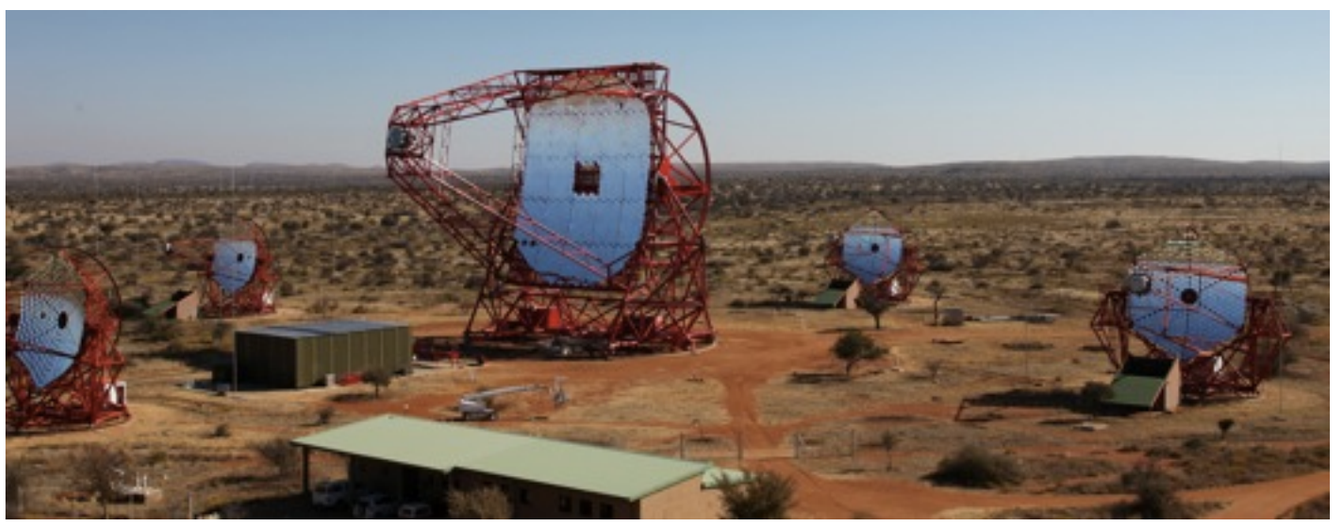
4: Boom Boom
John Lee Hooker

Largest ever Cherenkov telescope sees first light

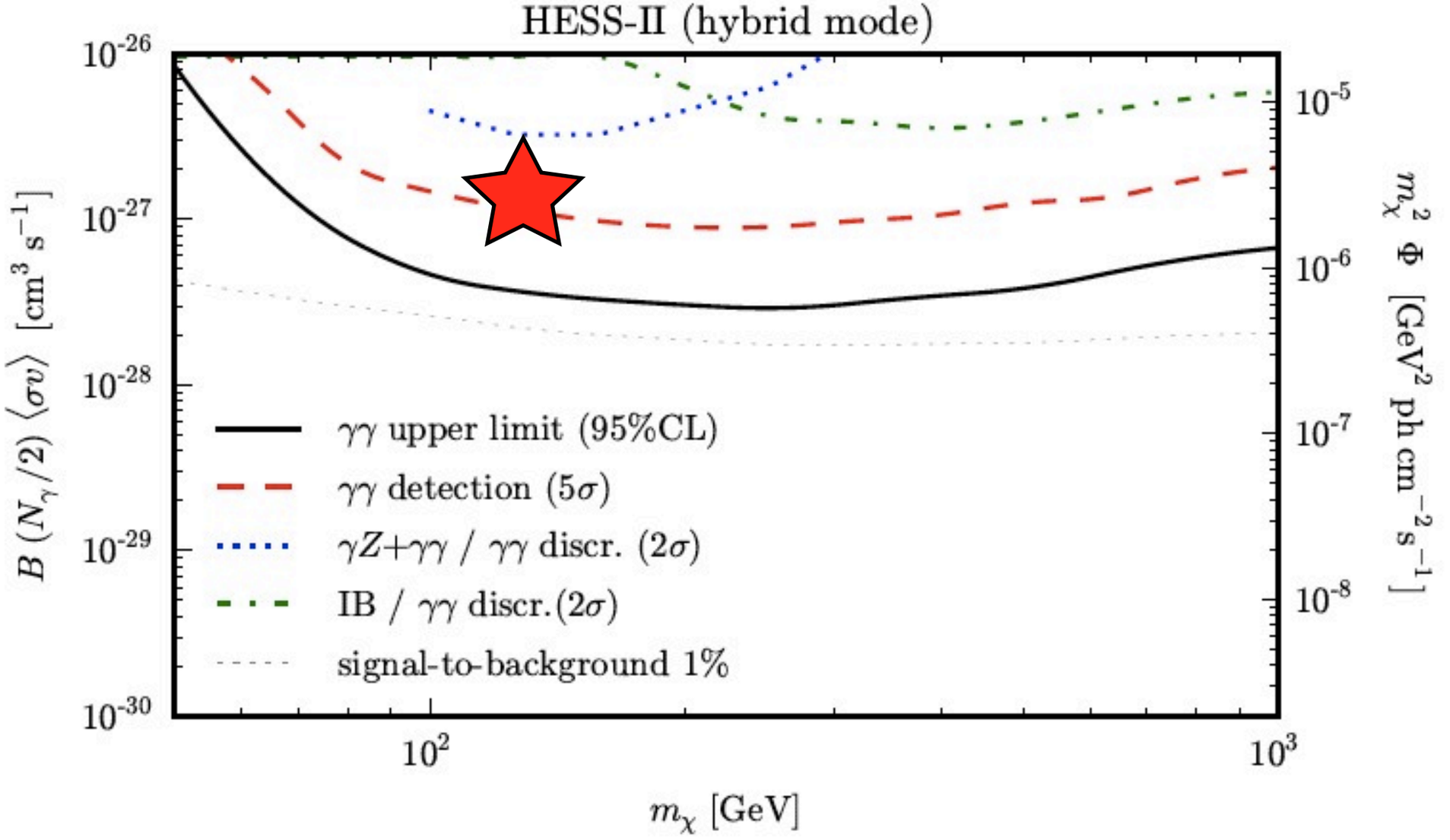
See also: Characteristics of the H.E.S.S. II telescope, and images

On 26 July 2012, the H.E.S.S. II telescope started operation in Namibia. Dedicated





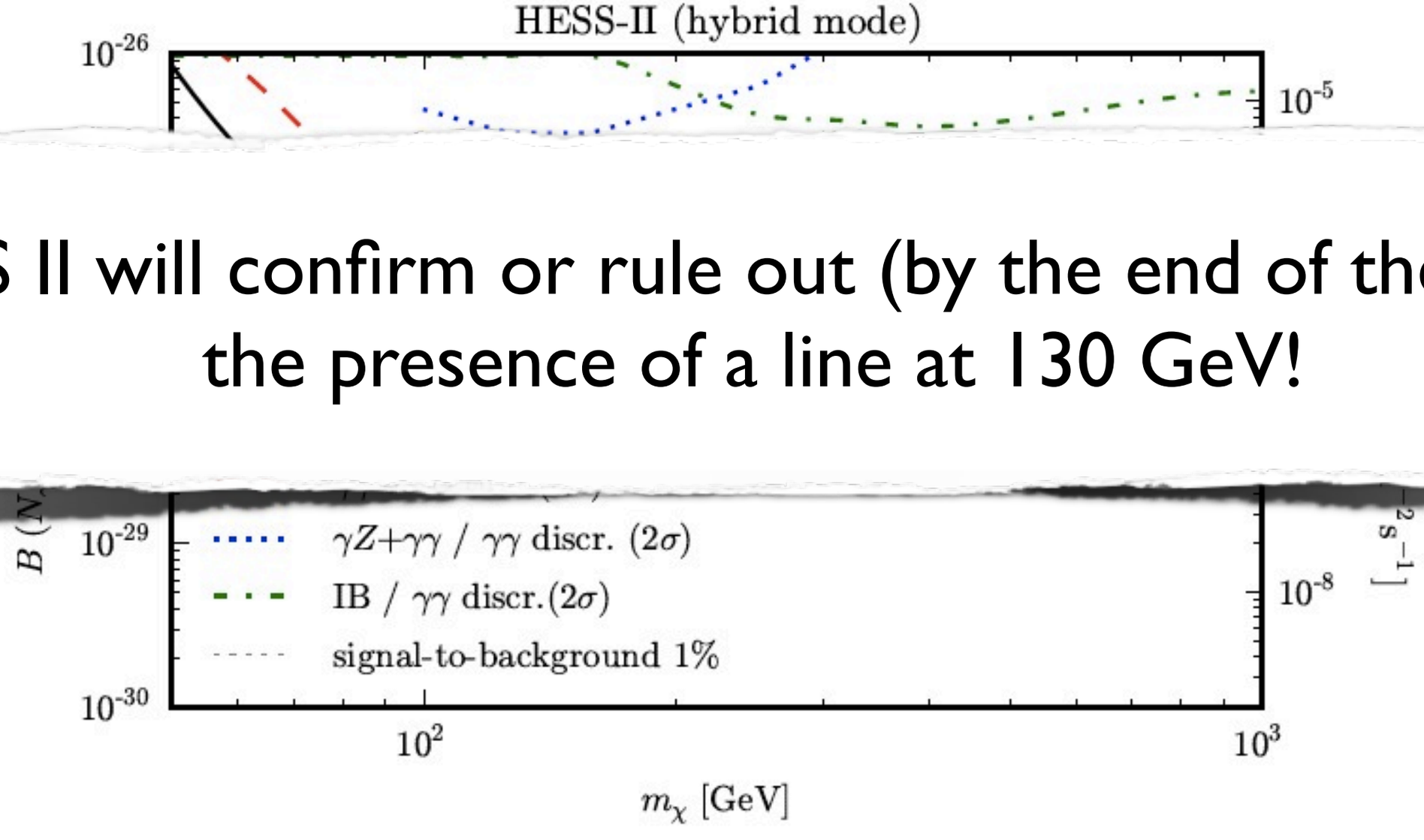
4: Boom Boom
John Lee Hooker



Bergstrom, Bertone, Conrad, Farnier, Weniger, arXiv: 1207.????

4: Boom Boom John Lee Hooker

HESS II will confirm or rule out (by the end of the year?) the presence of a line at 130 GeV!



Bergstrom, Bertone, Conrad, Farnier, Weniger, arXiv: 1207.????

5: Worried Life Blues

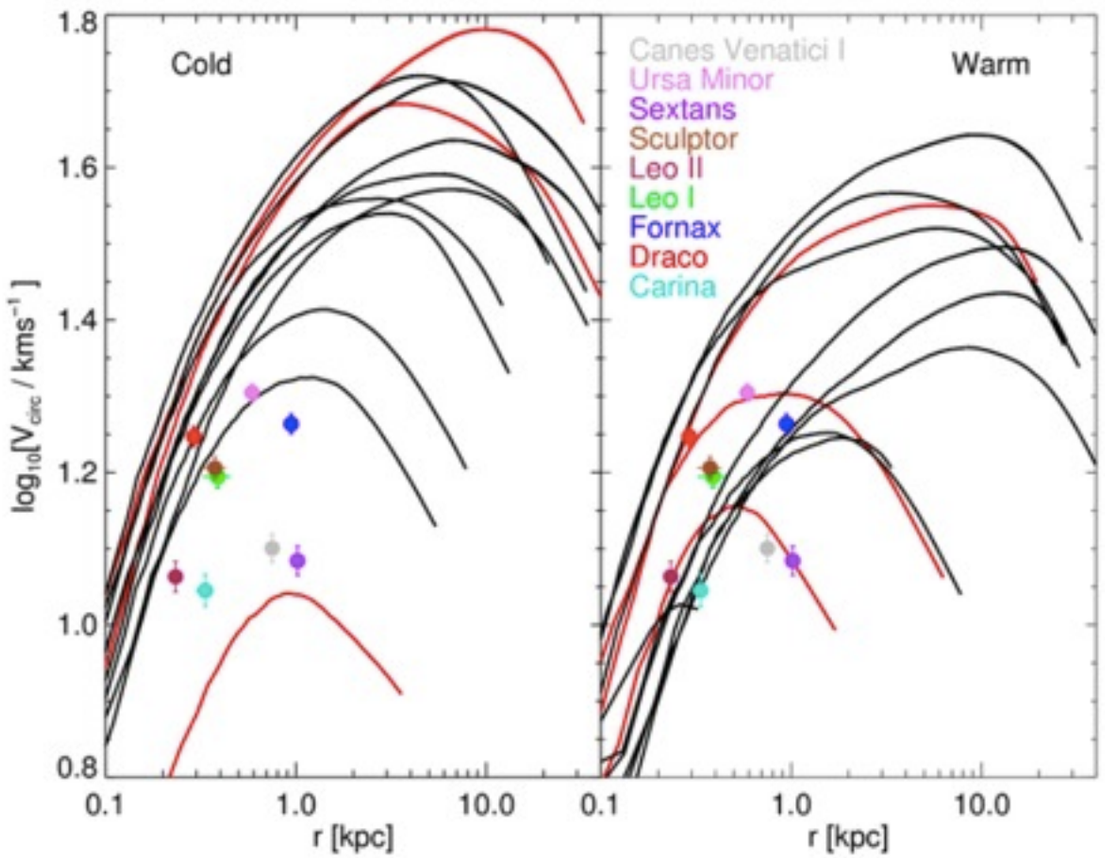
Sleepy John Estes

16 September 2011 Last updated at 13:47 ET

Dwarf galaxies suggest dark matter theory may be wrong

By Leila Battison
Science reporter, Bradford

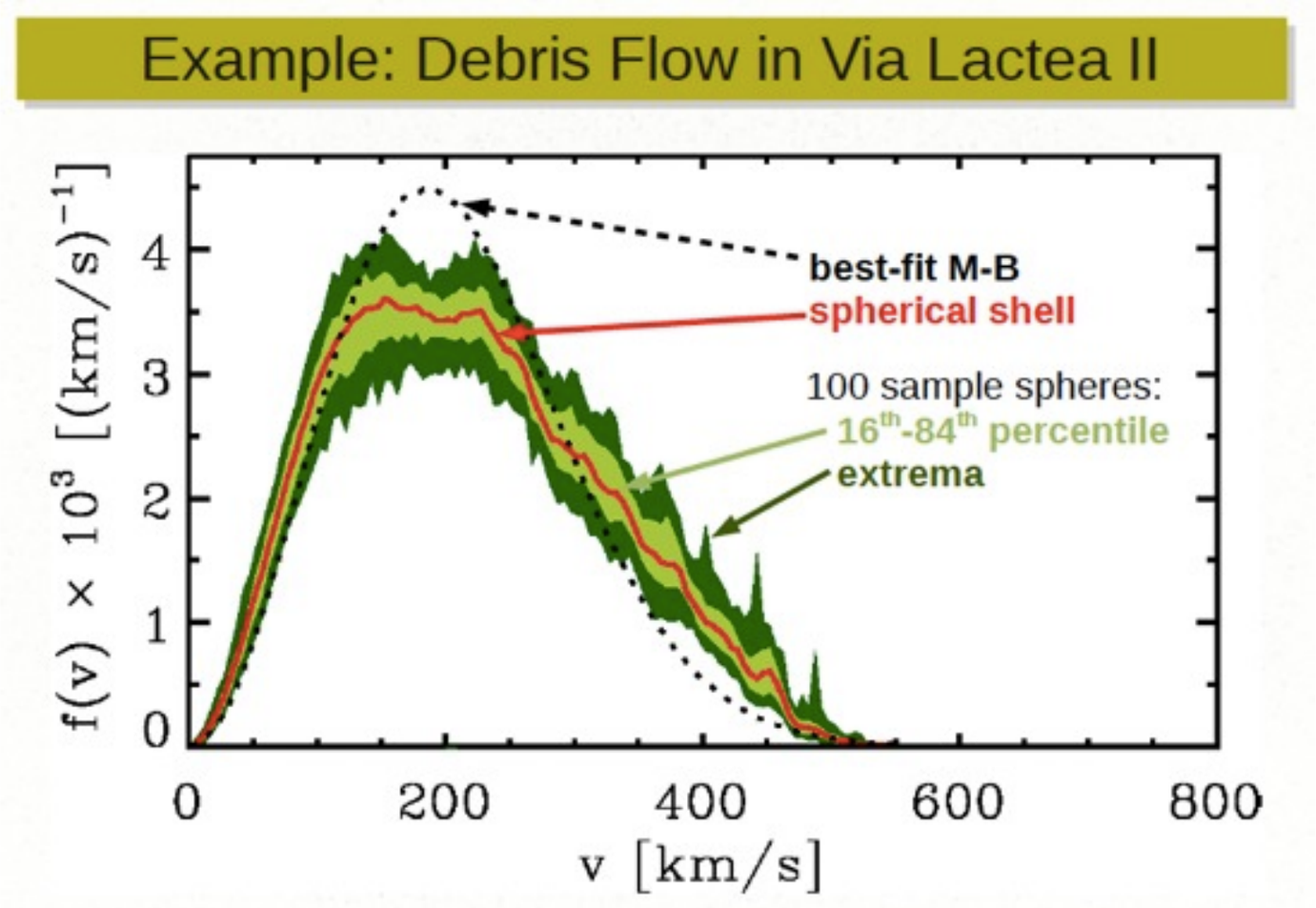
C. Frenk



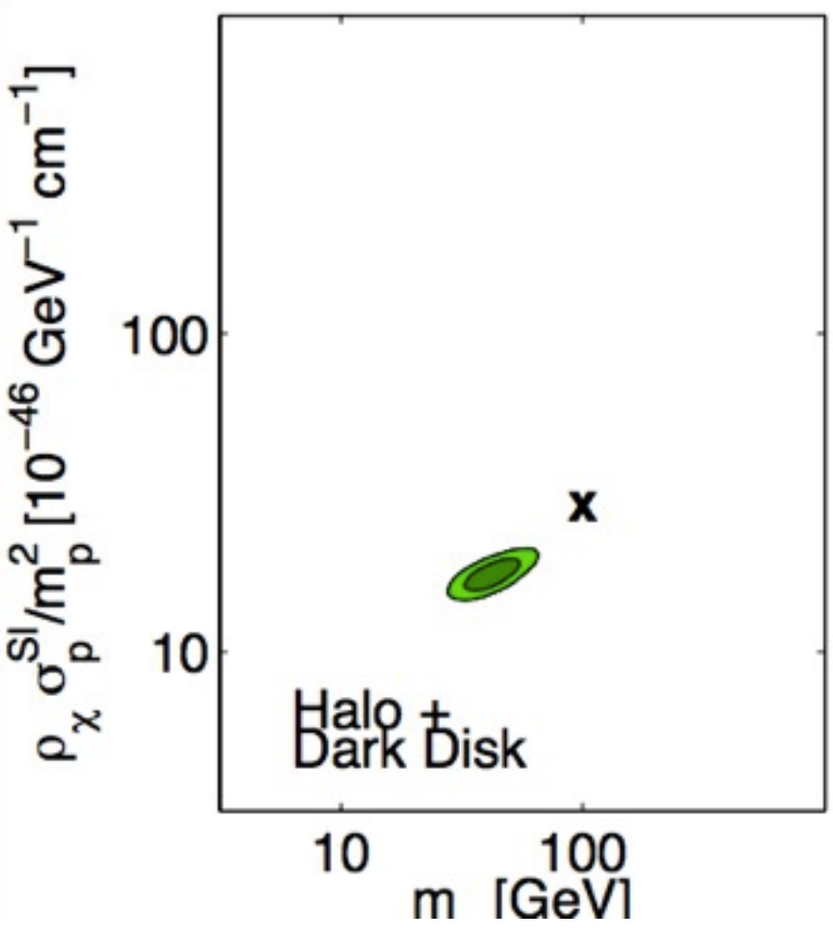
5: Worried Life Blues

Sleepy John Estes

M. Kuhlen



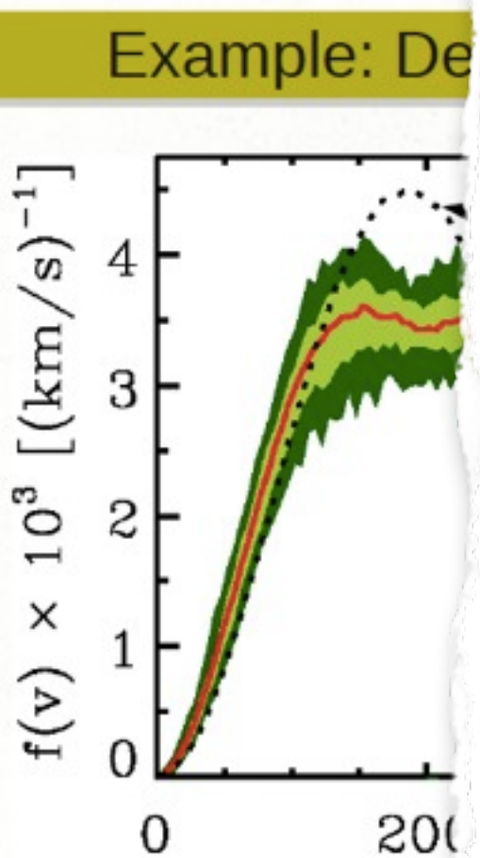
A. Peter

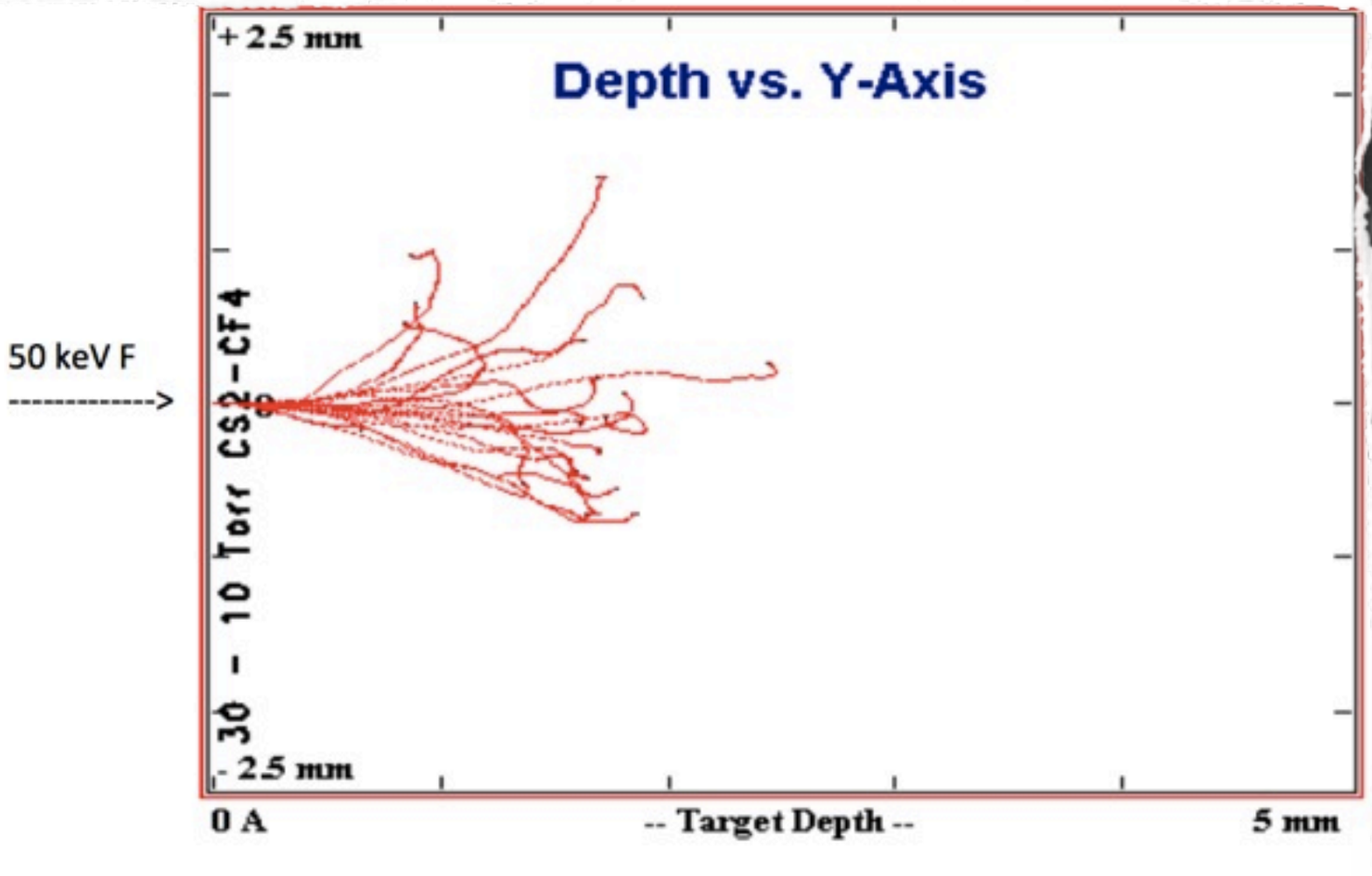


5: Worried Life Blues

Sleepy John Estes

Example: De





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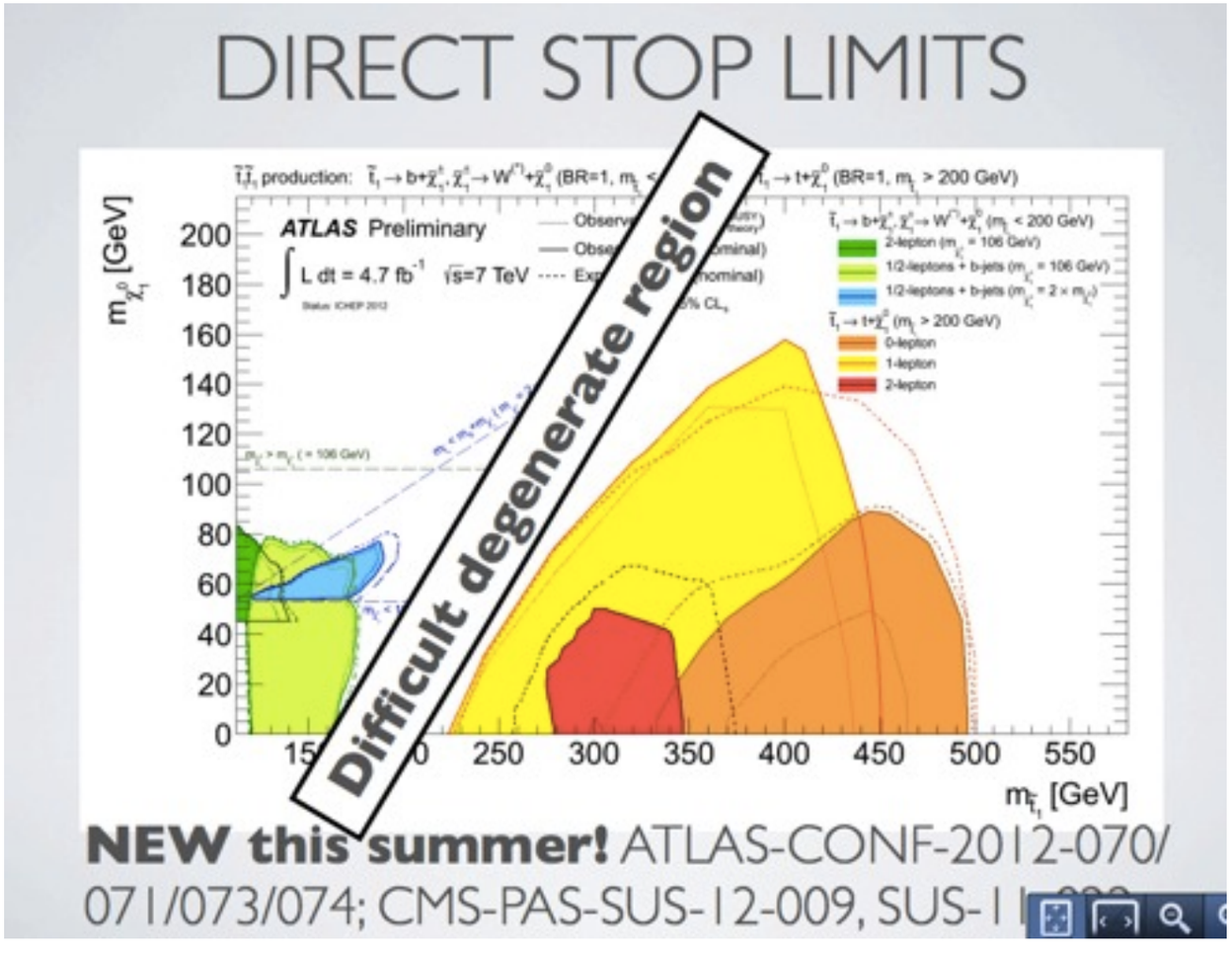
WIMP Astronomy? Directional detectors! - Dan Snowden Ifft

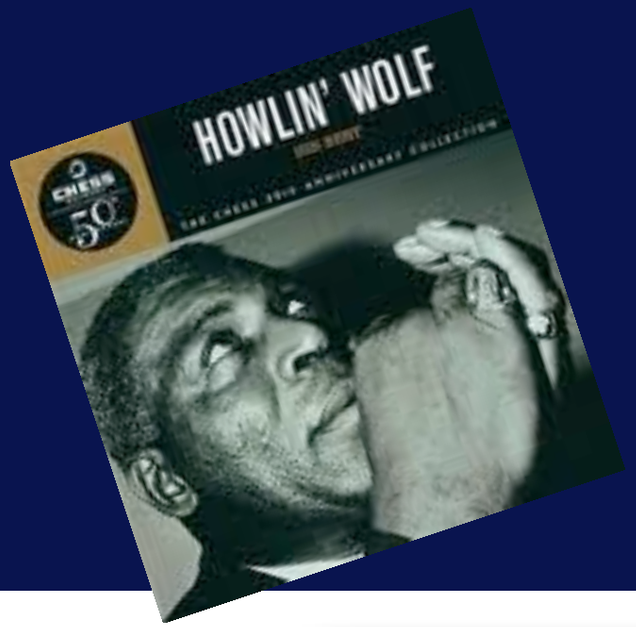
6: It hurts me too

Elmore James

Matthew Reece - Where's SUSY?



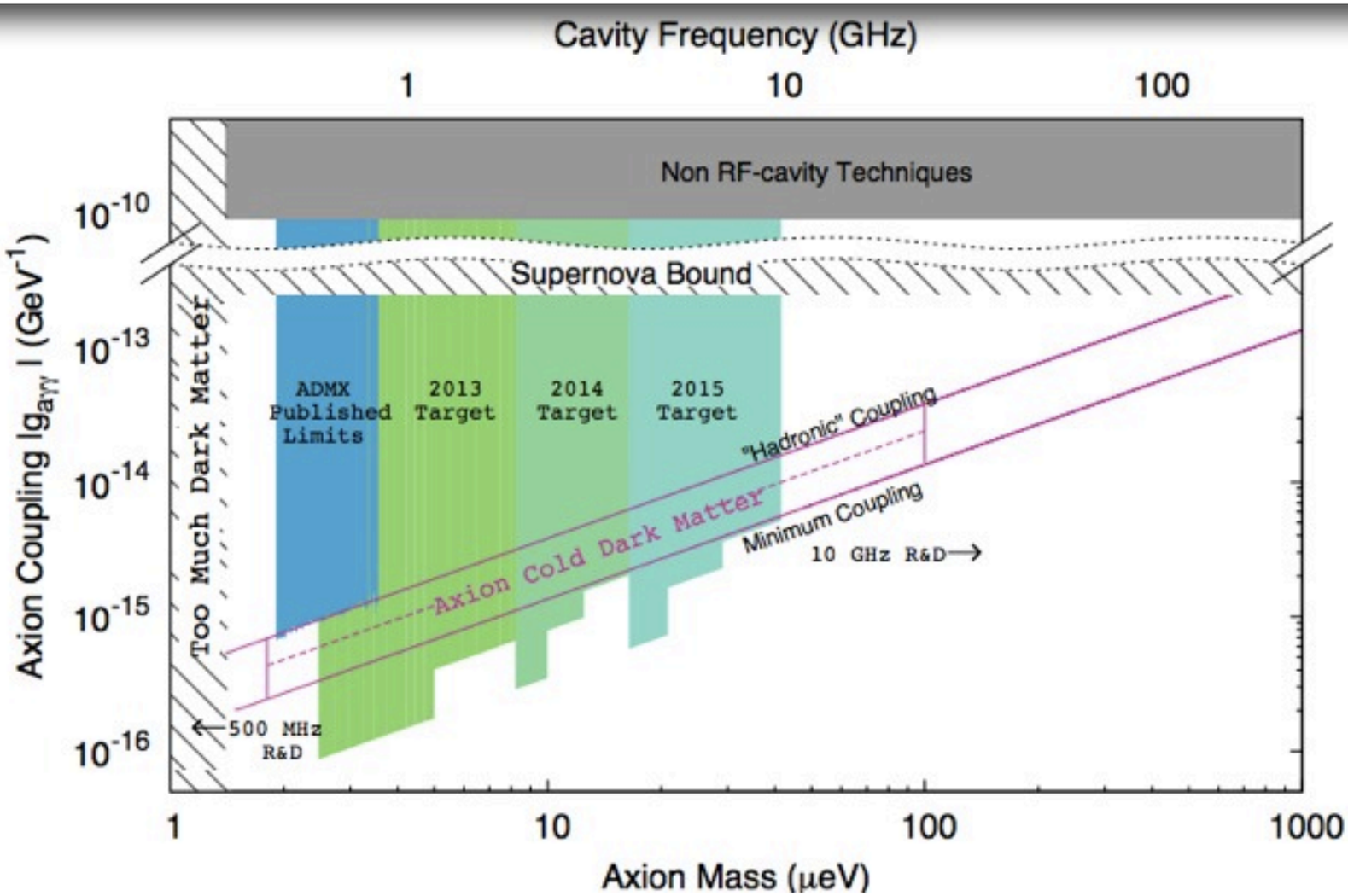
T. Tait and D. Whiteson
Mono-stuff



7: How many more years

Howlin' Wolf

"Axions: the thinking persons DM candidate," Michael Turner.



Axions: J. Jaeckel, A. Chou, L Rosenberg

7: How many more years

Howlin' Wolf

Soudan Runs (2012-14)

Demonstrate iZIP operation and final background reduction

Run still statistics-limited, but data and simulation ➔ already achieved !

Confirm limits for 60 GeV WIMP with germanium technology

Explore new parameter space for low mass WIMPs

Better discrimination at low energy

A long stable run could provide new annual mod. and axion limits.

2013 R&D

Scale up our detectors to higher mass. *Already testing the 4" detecto*

Streamline detector fab ➔ 6 iZIPs per month

Prepare new tower hardware, readout electronics, DAQ, Cryo and

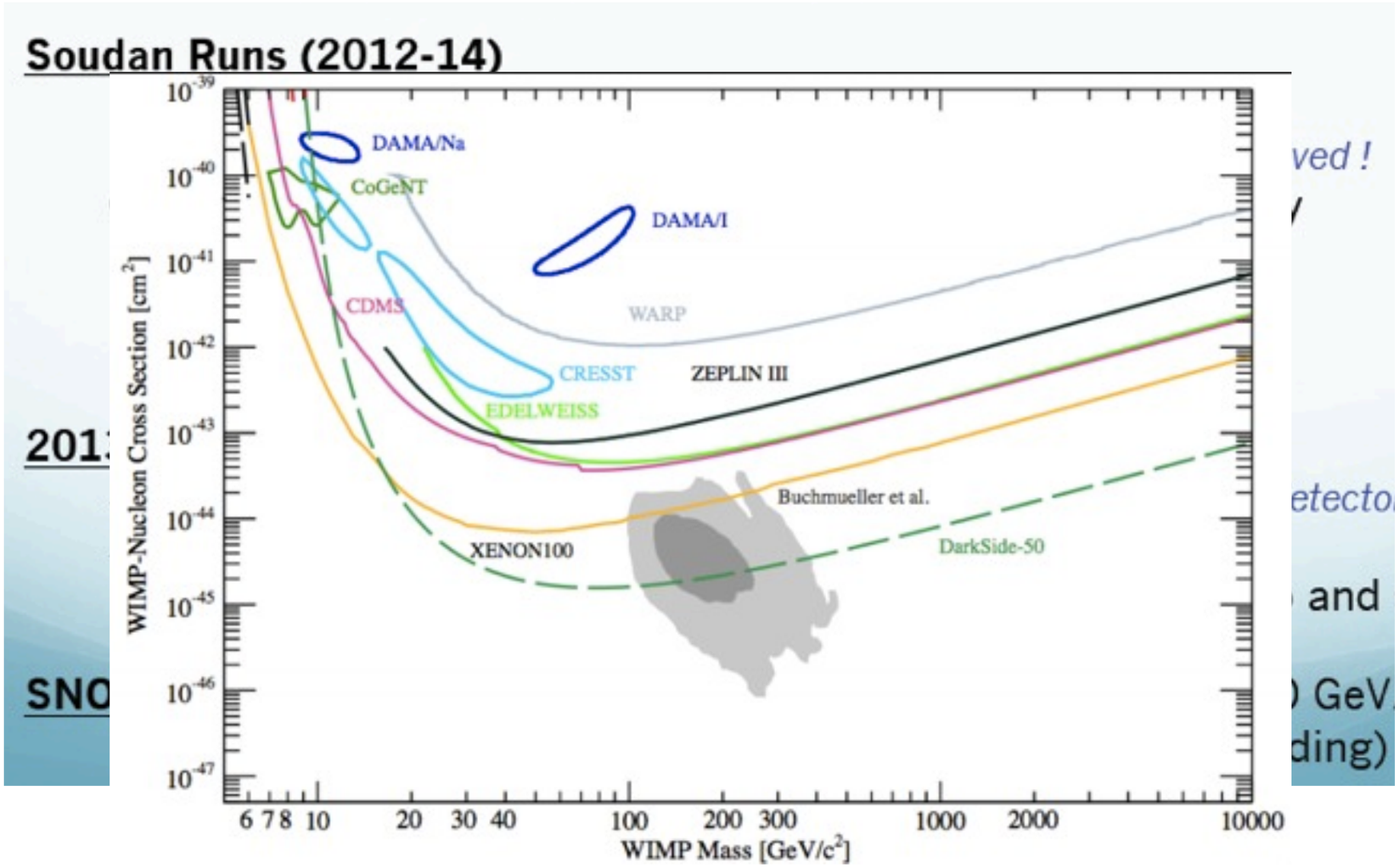
SNOLAB 200 kg (24 towers) run gets us to < 8 x 10^{-47} cm^2 @ 60 GeV

running at SNOLAB (deeper site, higher purity shielding)

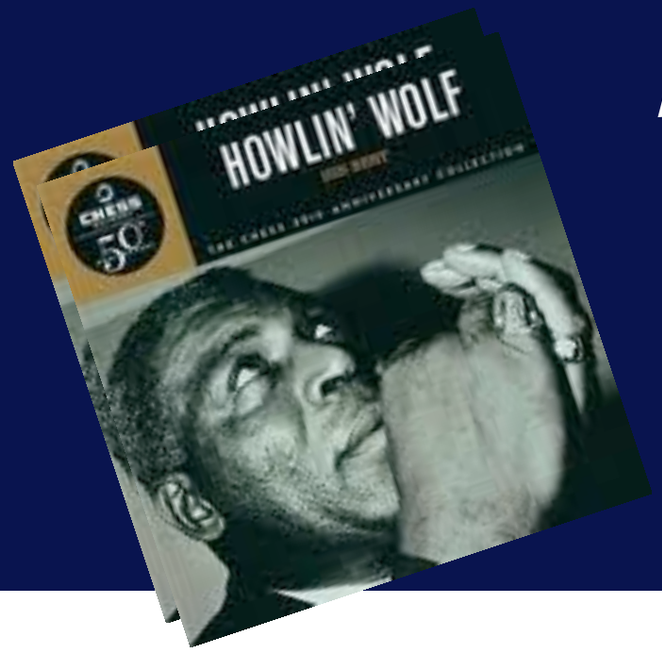
P. Cushman - SuperCDMS

7: How many more years

Howlin' Wolf

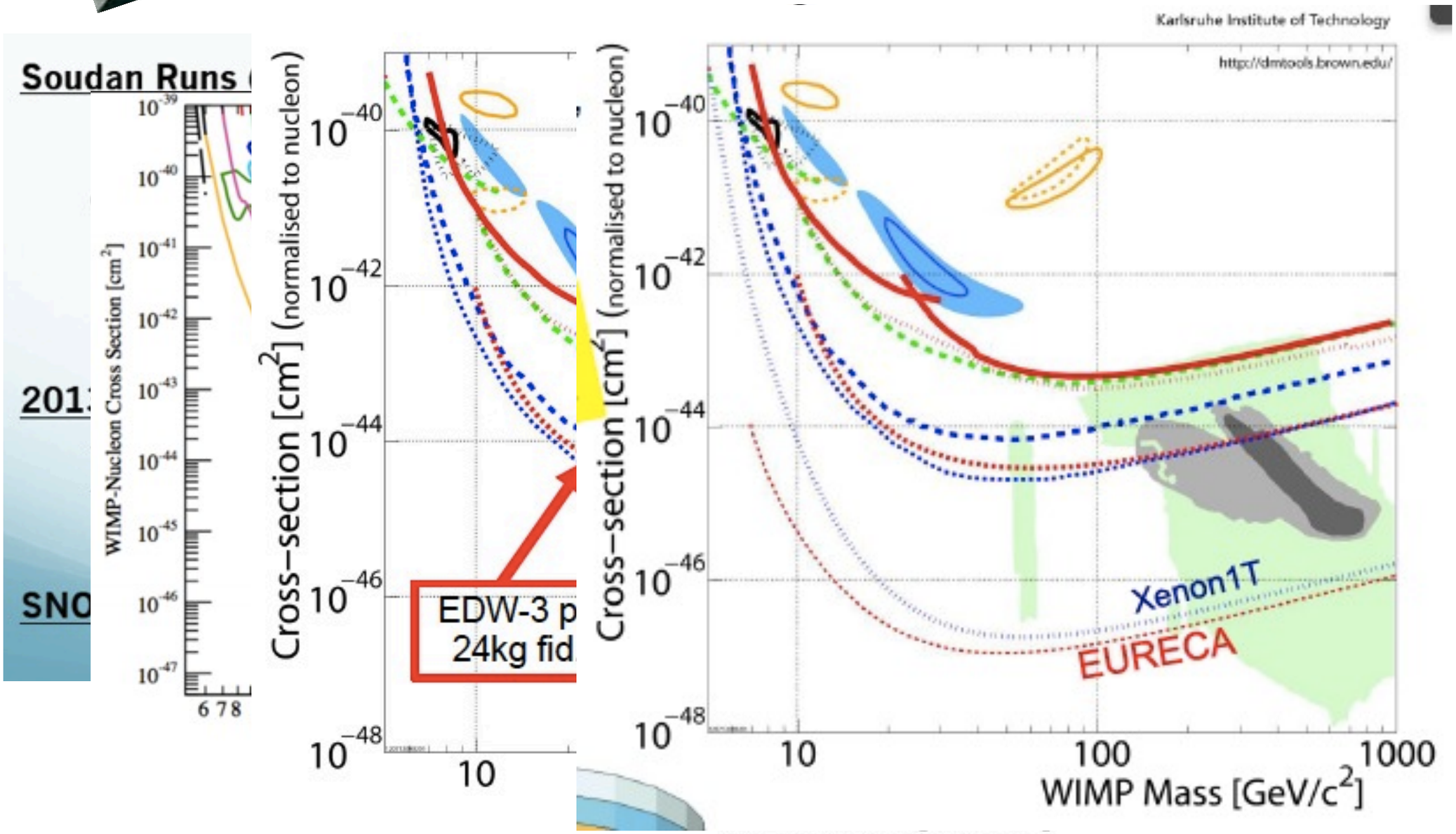


R. Saldanha - DarkSide

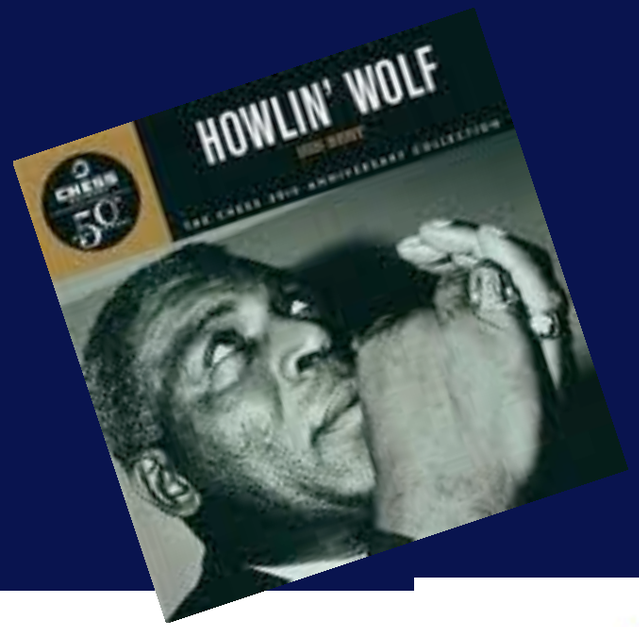


7: How many more years

Howlin' Wolf

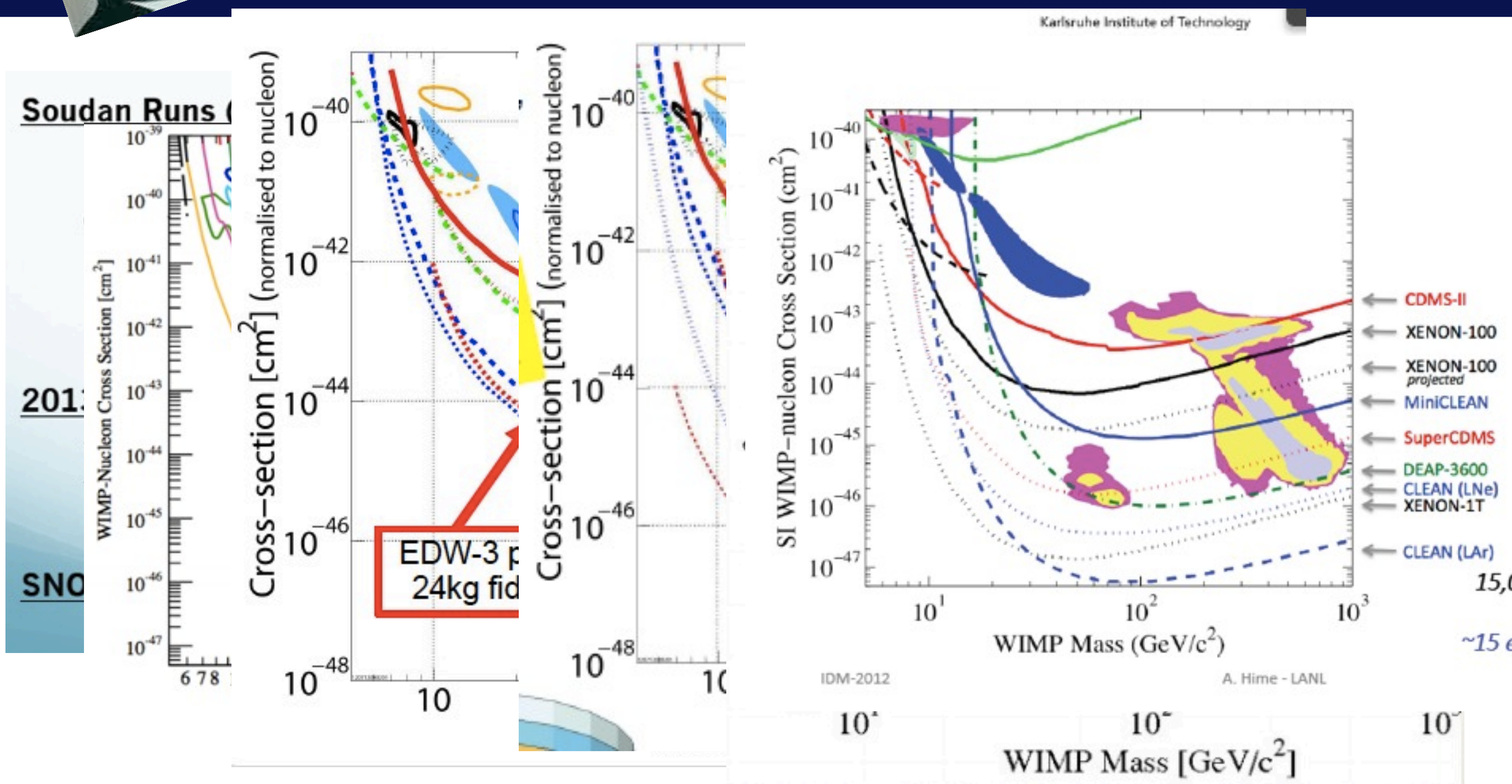


H. Kraus - Eureca



7: How many more years

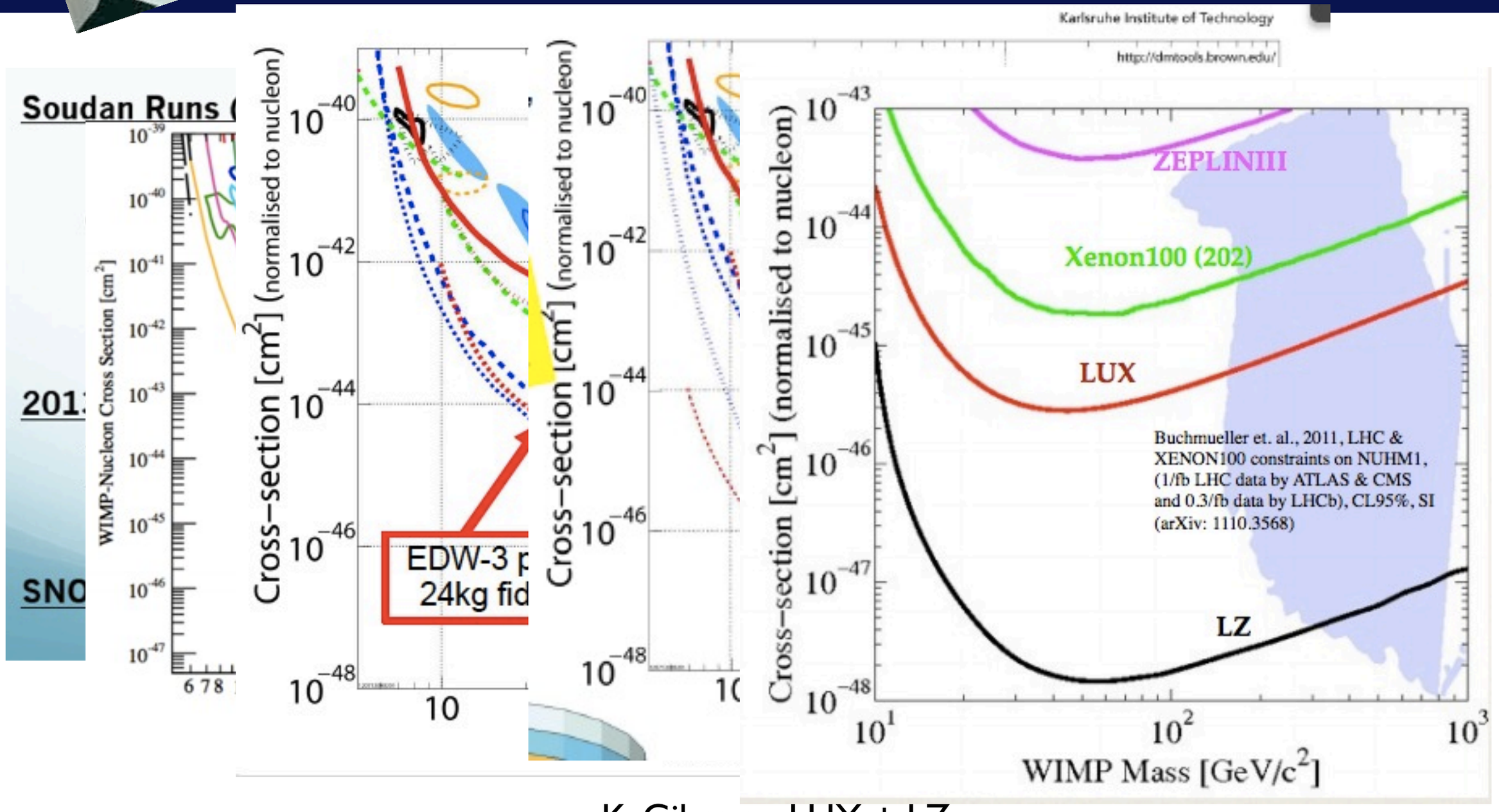
Howlin' Wolf



A. Hilme - CLEAN

7: How many more years

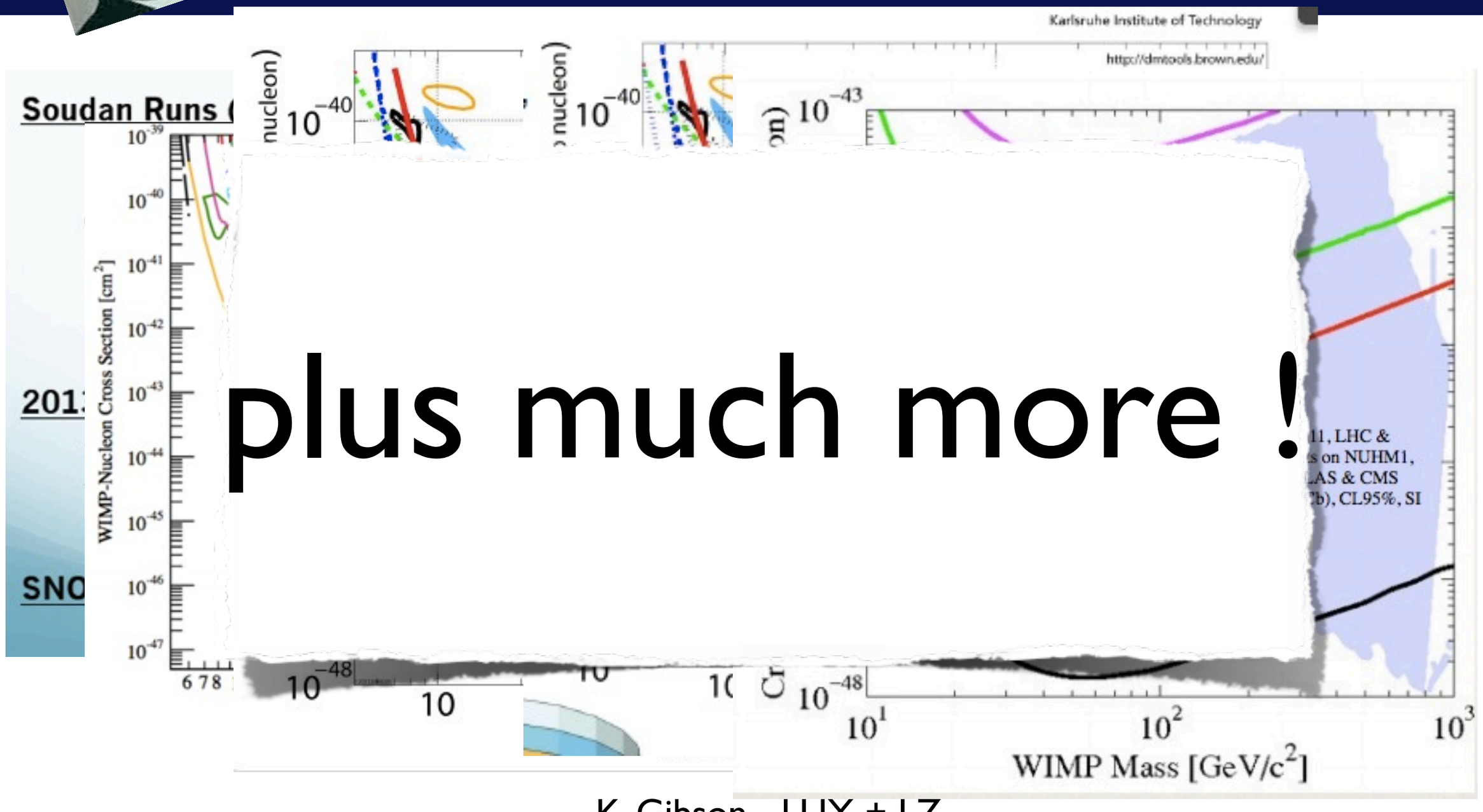
Howlin' Wolf



K. Gibson - LUX + LZ

7: How many more years

Howlin' Wolf



plus much more !

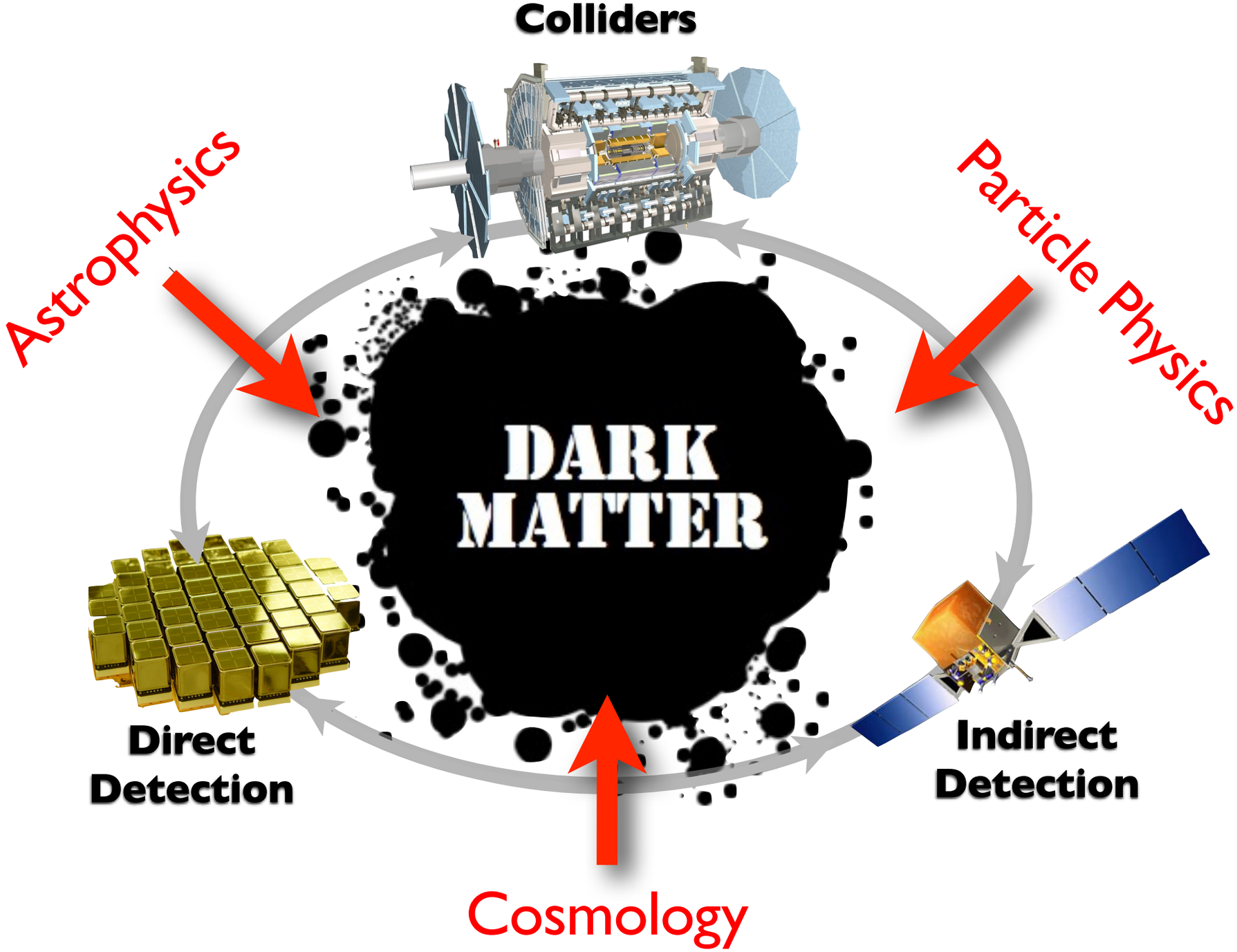
K. Gibson - LUX + LZ

8: Crazy Blues

Mamie Smith

9: We're gonna make it

Little Milton



10: Further on up the road

Bobby 'Blue' Bland

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IDM 2012

Join me as I thank the organizers for a GREAT conference!