Andreas Ringwald Fest

Z. Fodor
Penn State, Univ. Wuppertal, FZ Juelich, Univ. Budapest, UCSD

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I will choose one work from each time period

- Z-burst explanation of UHECRs and neutrino masses
- topological susceptibility at large temperatures

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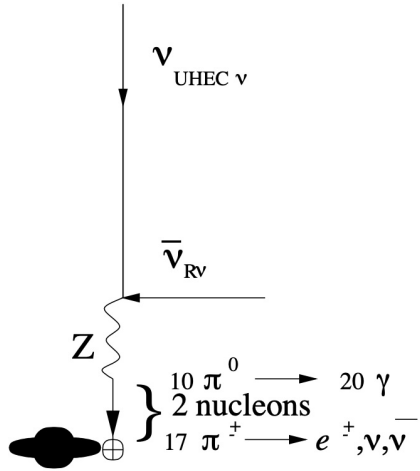
UHECR neutrinos hitting relic neutrinos
Z-burst $\Rightarrow$ UHECR hadrons
scenario depends on the neutrino mass



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After over two decades, we still don't know the absolute scale

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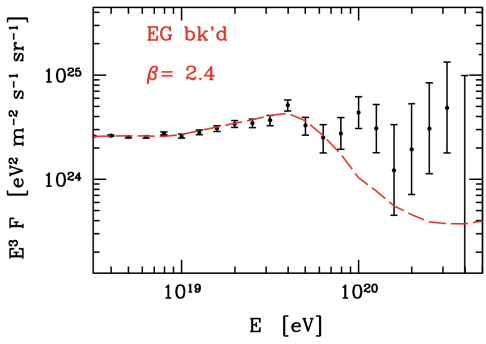

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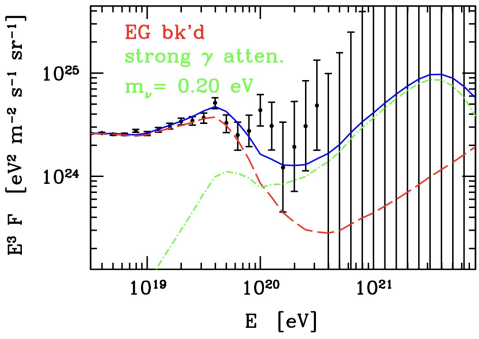

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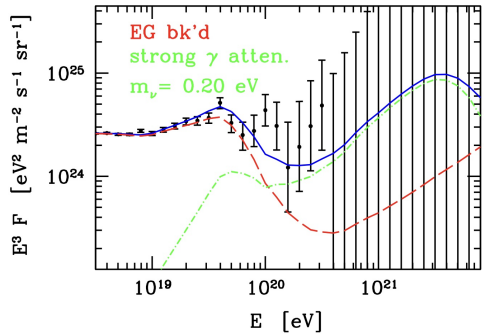

2017: instead of the 30 UHECR events, what could have confirmed AGASA
Auger saw only two events $\Rightarrow$ GZK cutoff is there
(Earlier large E/flux results: probably incorrect energy calibration issue)

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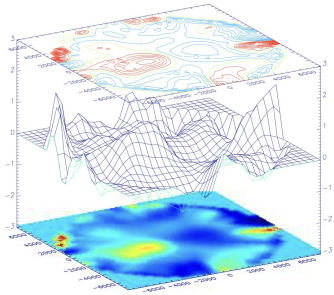

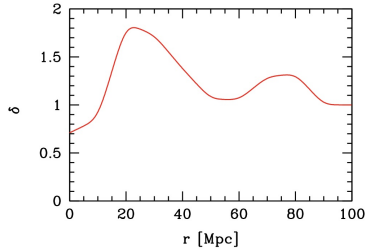

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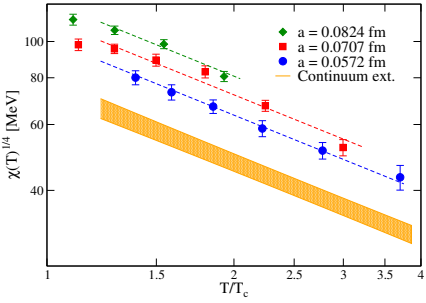

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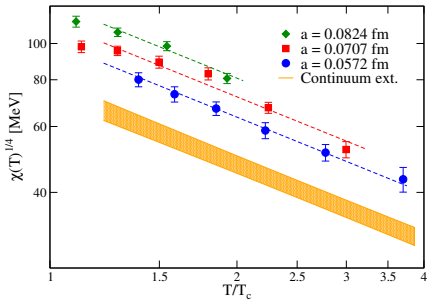

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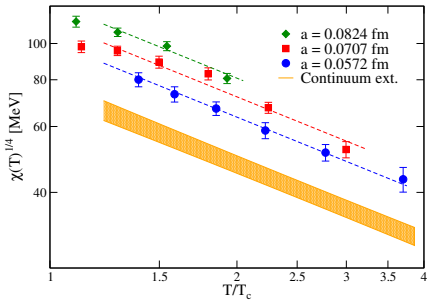

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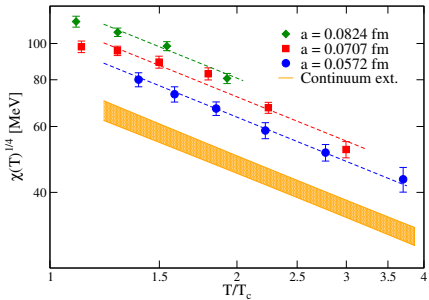

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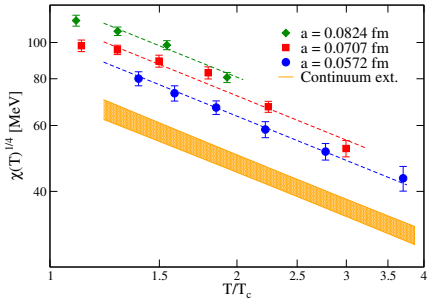

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$\Rightarrow$ further study is obviously necessary

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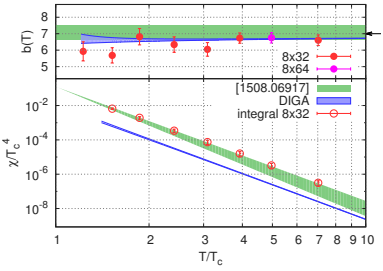

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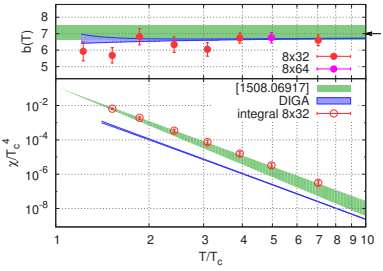

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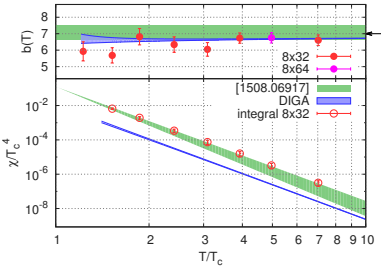

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Dilute Instanton Gas Approximation:
exponent agrees nicely, but order of magnitude difference in χ

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very few topology changes (hard): S. Borsanyi et al. Nature 539 (2016) 69

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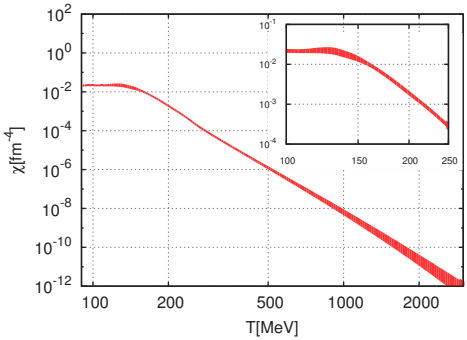

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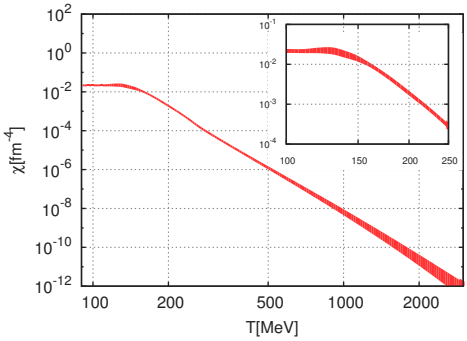

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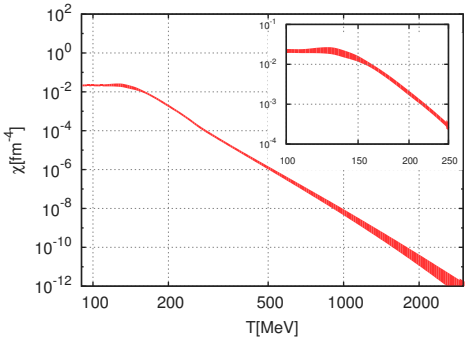

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