Argelander-
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Search for UHE neutrinos using a refurbished 25-m telescope

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Rationale behind this talk:

- Radio telescopes are expensive devices
- Time allocation committees need to consider a broad range of different scientific fields
- Telescopes are oversubscribed
- UHE neutrino flux is low – observations need huge amounts of time
- Way out: Use a dedicated telescope

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We have such a telescope !

25 m diameter
Astropeiler Stockert
built 1956
operated by University
of Bonn and MPIfR

shut down 1997
got private property
industrial monument 1999

since 2005 owned by
NRW foundation
At present
in reconstruction!

Technical details

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Technical details

- New prime focus system at 1.4 GHz - Tsys 50 K
- Bandwidth 140 MHz
- HPBW 0.6 deg
- FPGA spectrometer

- Second receiver at 400 MHz for simultaneous observations at two frequencies?

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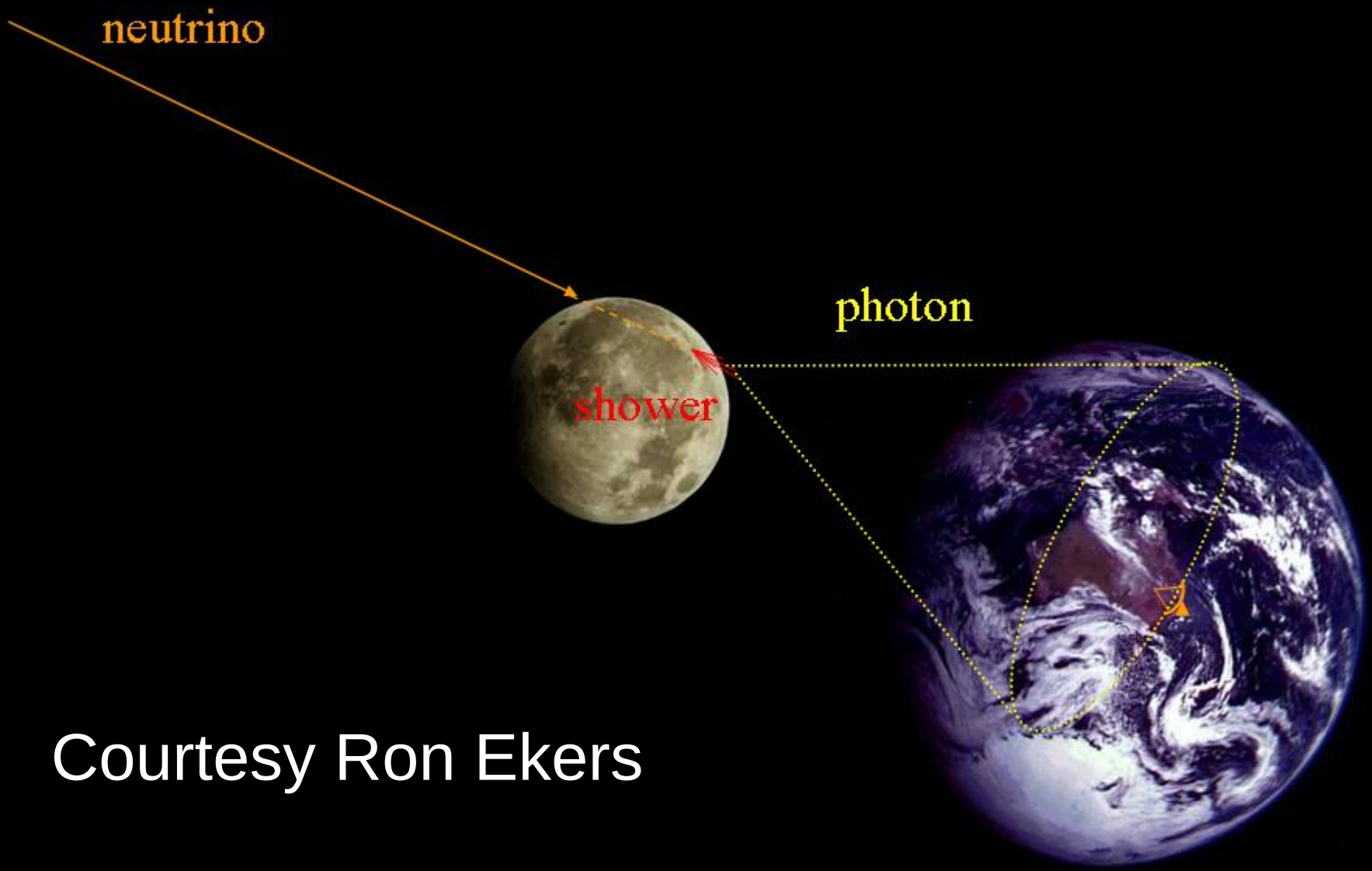
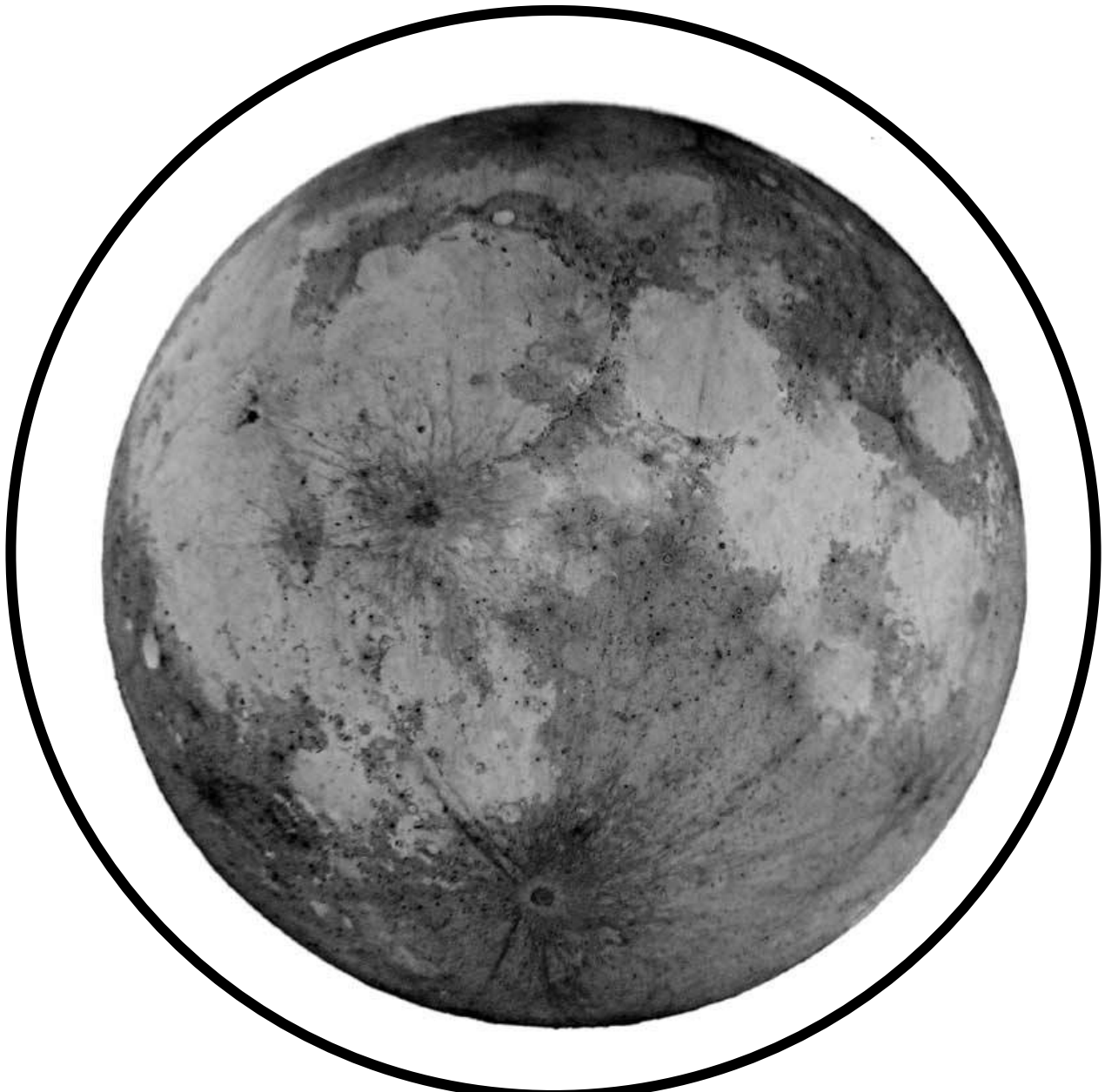
Lunar Cherenkov emission



Courtesy Ron Ekers

Skimming the Moon with HPBW 0.6^{o}



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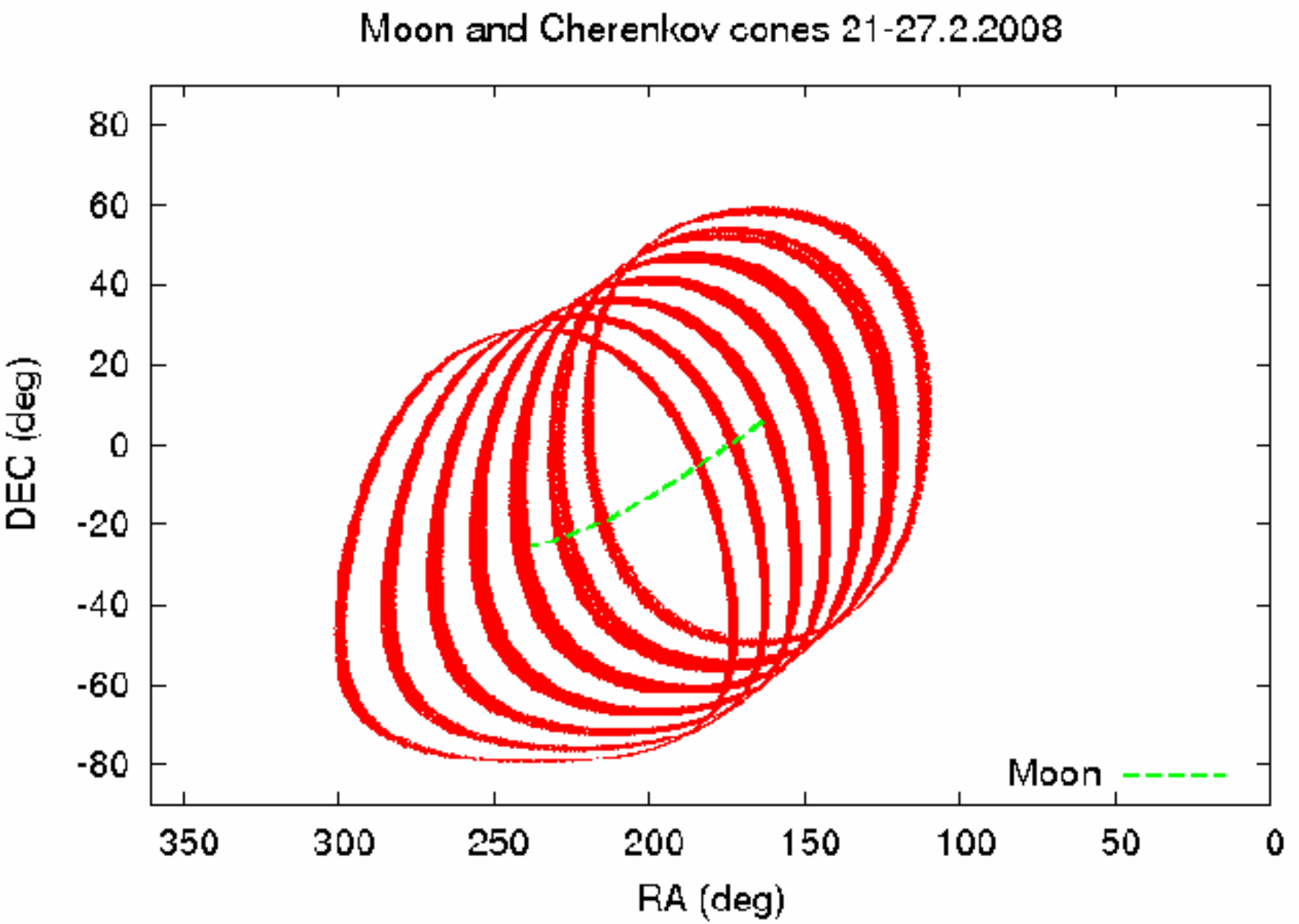
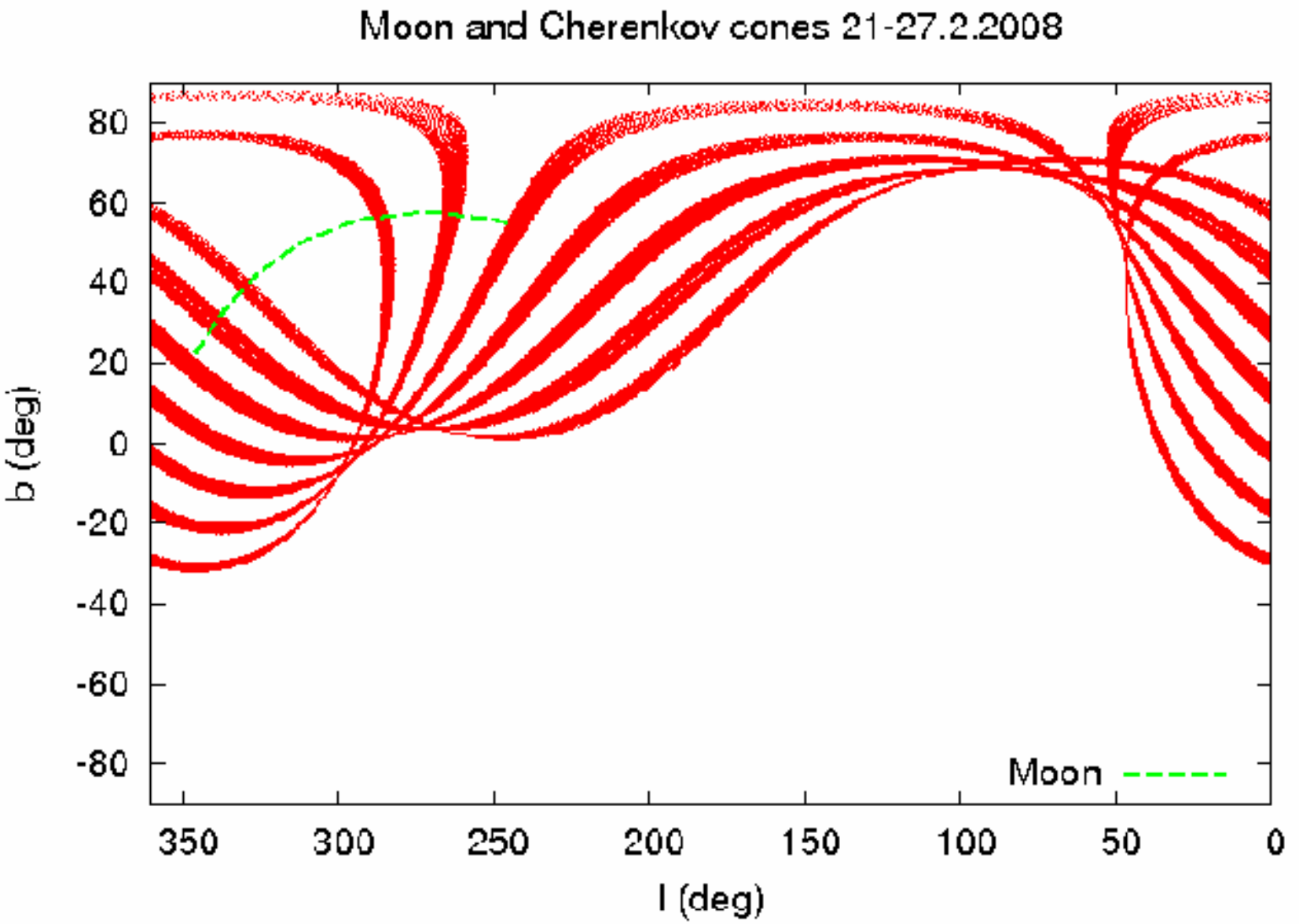
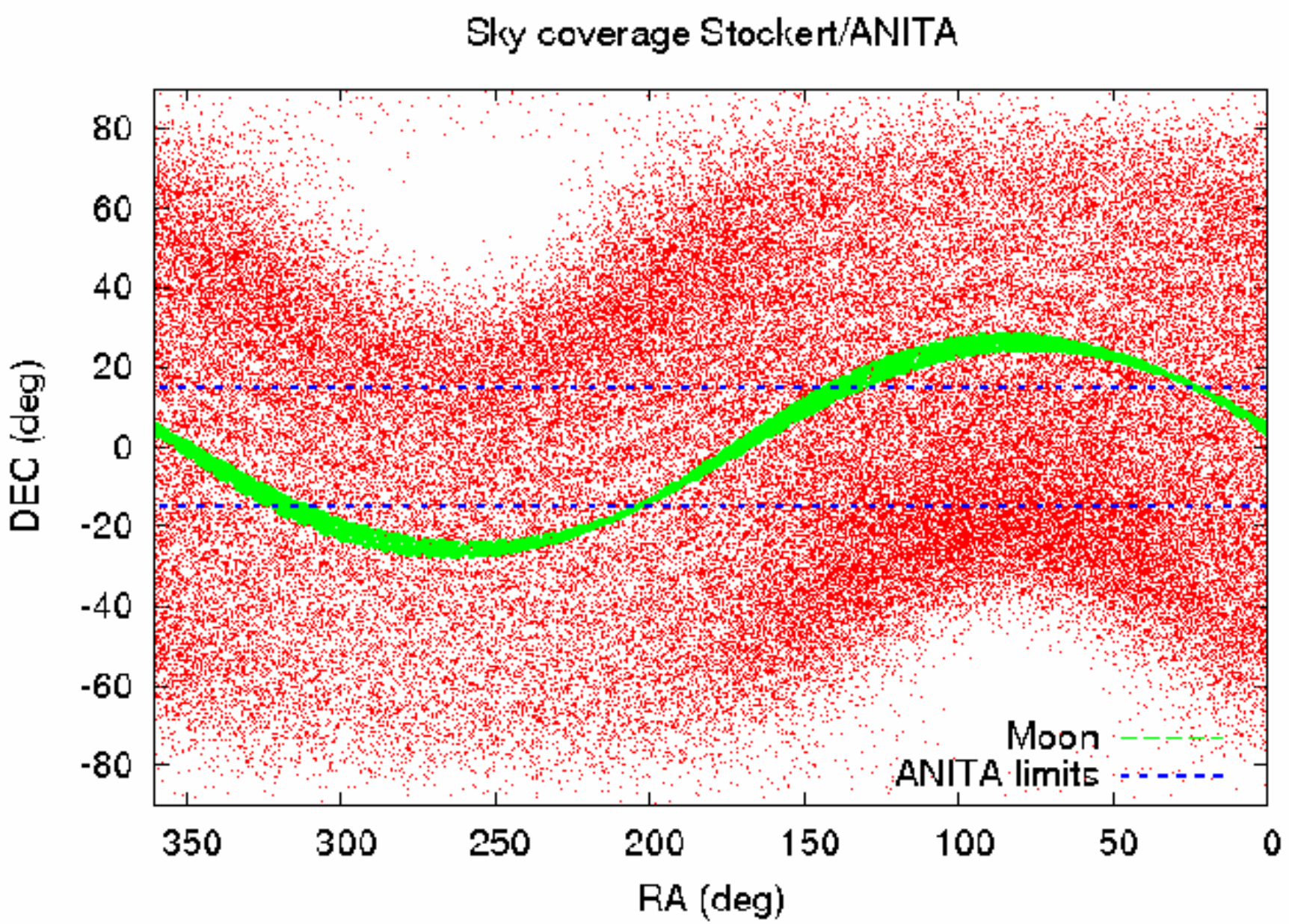
Observing UHE neutrinos – one week



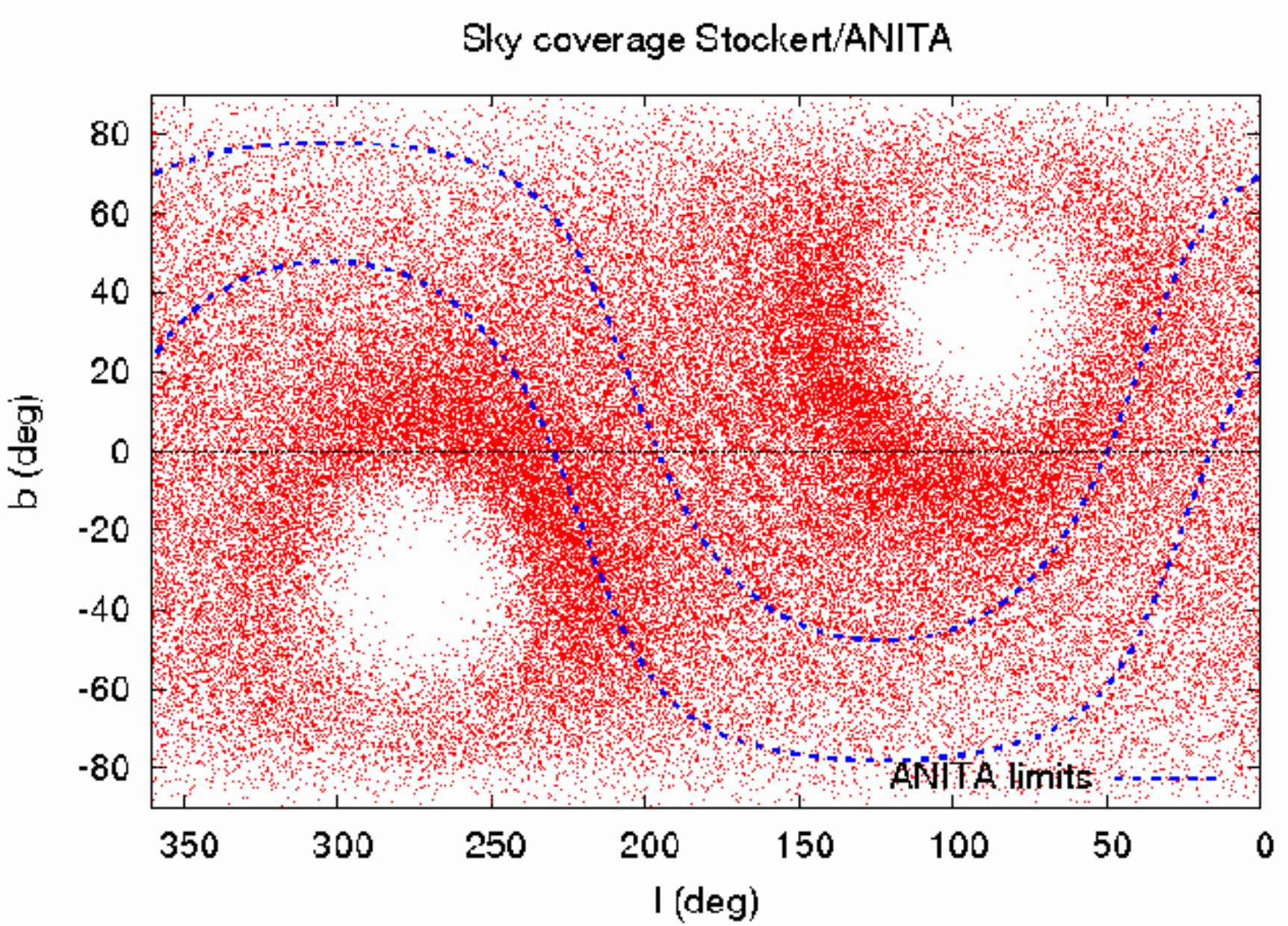
Observing UHE neutrinos – one week in l,b



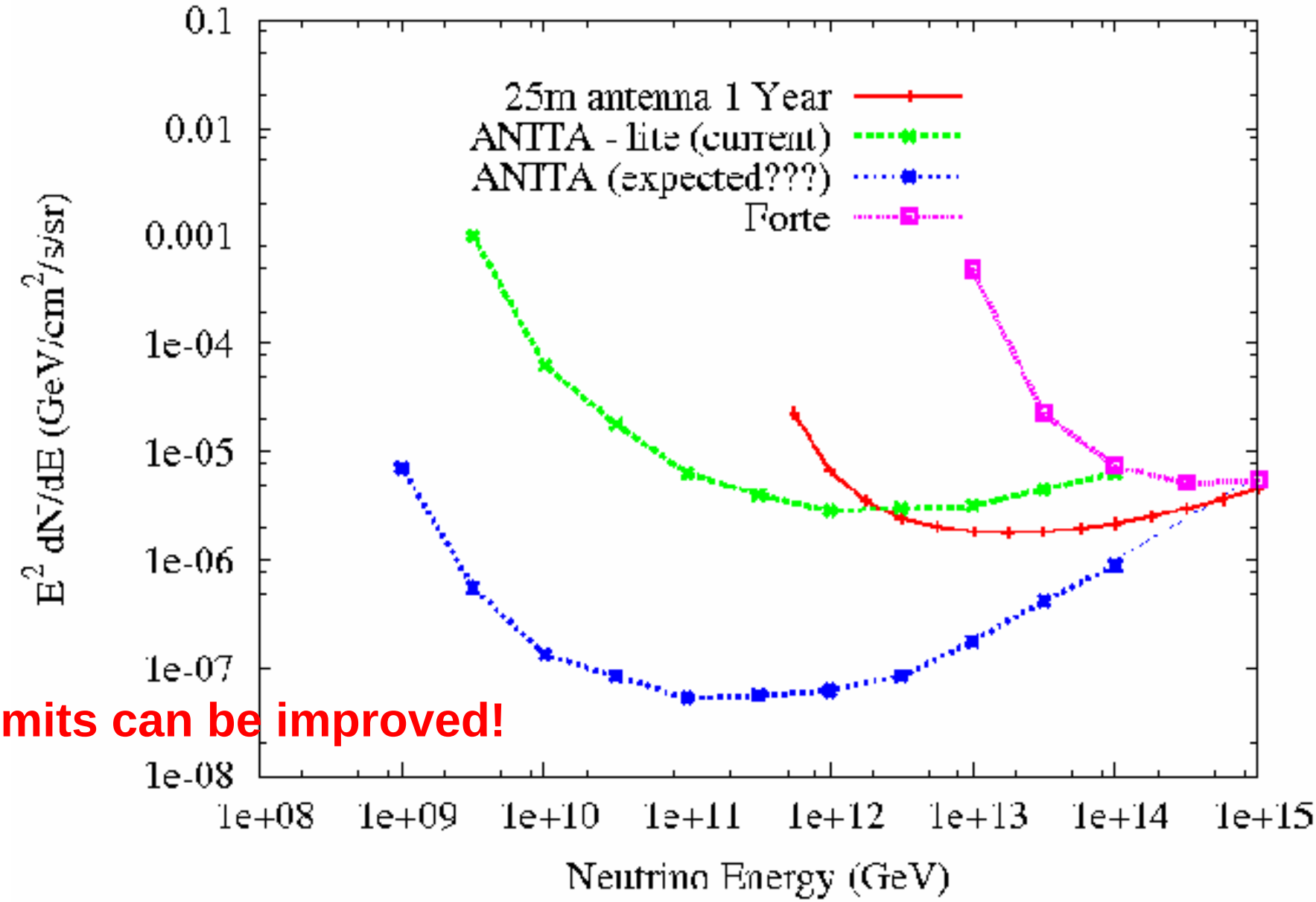
Sky coverage in equatorial coordinates



Sky coverage in Galactic coordinates



Sensitivity - 1 year limits (thanks to C.W. James)



Limits can be improved!

Conclusions

- A long term project with a 25 m telescope can explore a new parameter space

- After completion of the reconstruction work only little additional effort necessary for such a project
  - data acquisition, automated telescope control, second receiver
  - two FPGA backends (MPIfR design)
  - alltogether < 20 K€

- Low cost experiment (operations < 300 K€ for 3 years)

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Problems to solve

- The NRW foundation will complete all necessary reconstruction work but does not support scientific projects
- The Deutsche Forschungsgemeinschaft (DFG) supports scientific projects but no operational costs
- The project can be run by students (DFG support)
- We need to find a sponsor who would be willing to pay for electricity and telescope maintenance….

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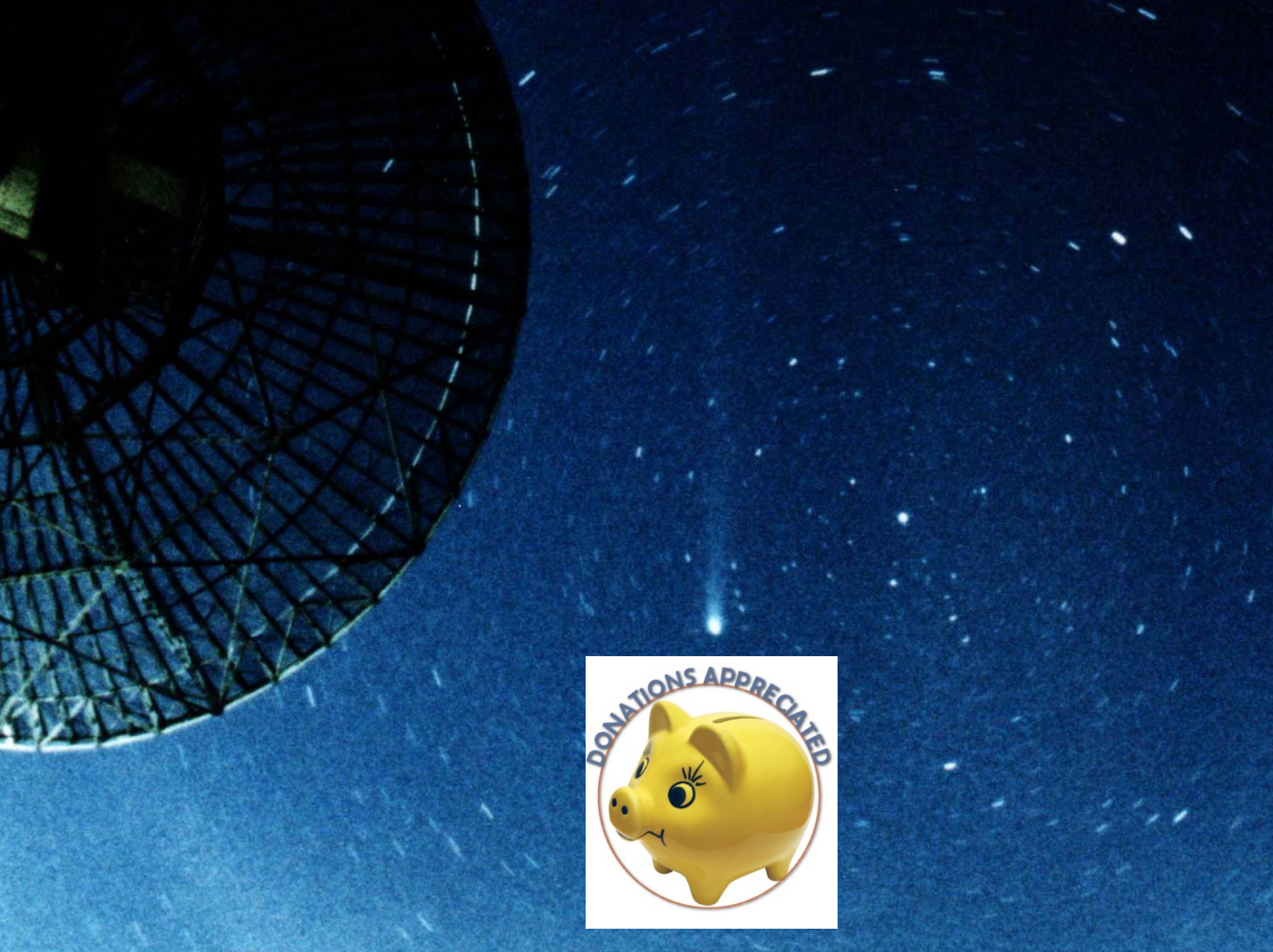
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