



Goddard
SPACE FLIGHT CENTER

MEGO

ALL-SKY MEDIUM ENERGY GAMMA-RAY OBSERVATORY

Carolyn Kierans^a on behalf of the AMEGO Team^b

^aNASA/GSFC, ^b<https://asd.gsfc.nasa.gov/amego/>

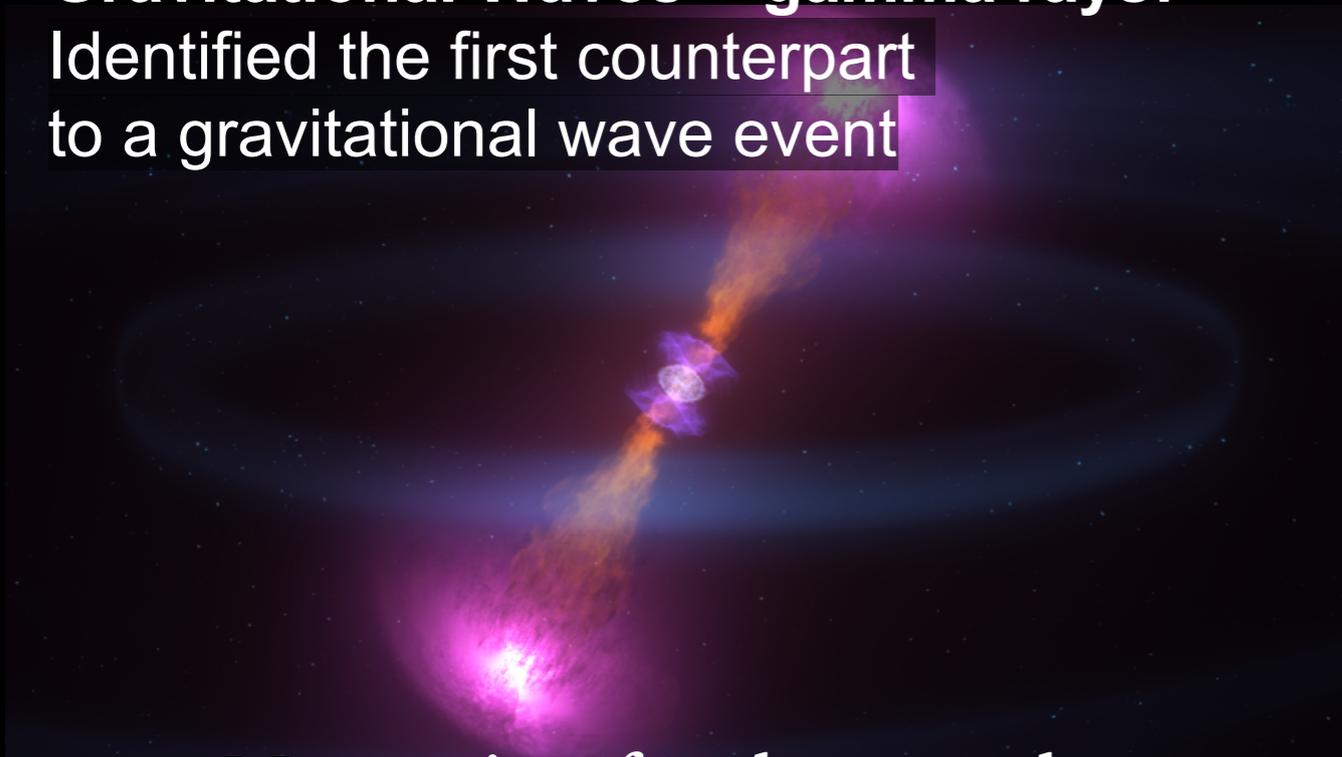
Snowmass 2021 Community Planning Meeting, Session #140
October 6th, 2020

AMEGO is a Multimessenger Observatory

Gamma-ray observations played the critical discovery role in all major multimessenger discoveries in the past half decade

Gravitational Waves + gamma rays:

Identified the first counterpart to a gravitational wave event



Measuring fundamental parameters of spacetime

High energy neutrinos + gamma rays:

Identified the first source of high energy neutrinos outside the galaxy



Discovering one of the most extreme accelerators in the universe

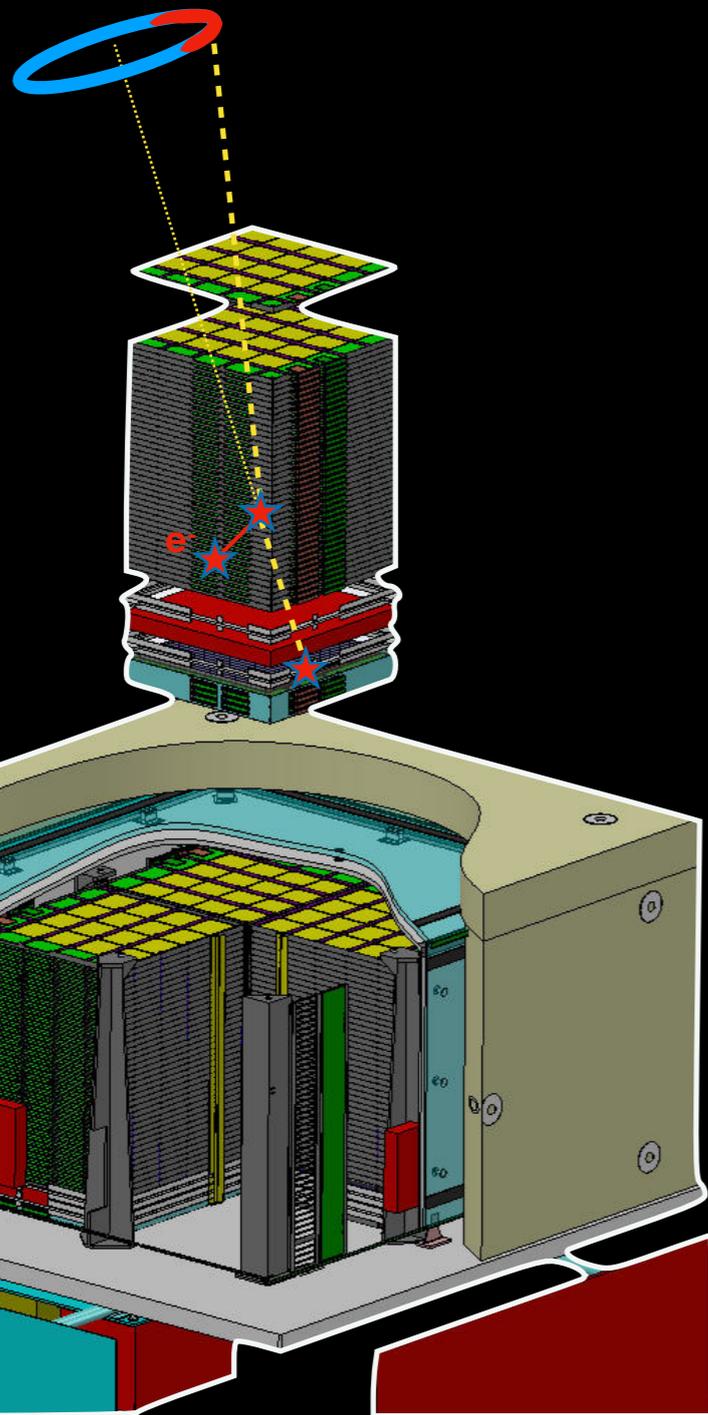
From stellar mass to supermassive black holes:
multimessenger sources are gamma-ray sources

CF LOIs: 046, 121, 122, 143, 151, 176, 182, 214

AMEGO – Instrument Design

IF LOIs: 100, 115, 127, 154, 170

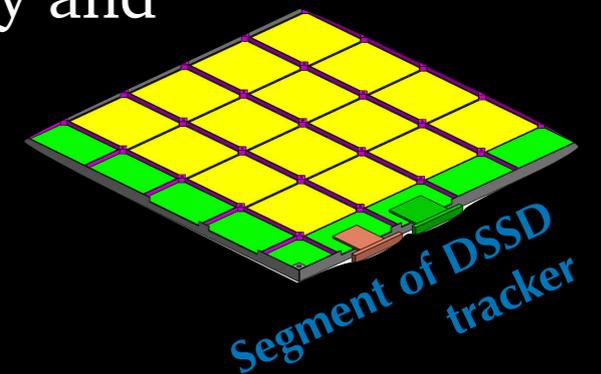
Compton telescope $\lesssim 10$ MeV



Tracker

Incoming photon undergoes pair production or Compton scattering. Measure energy and track of electrons and positrons

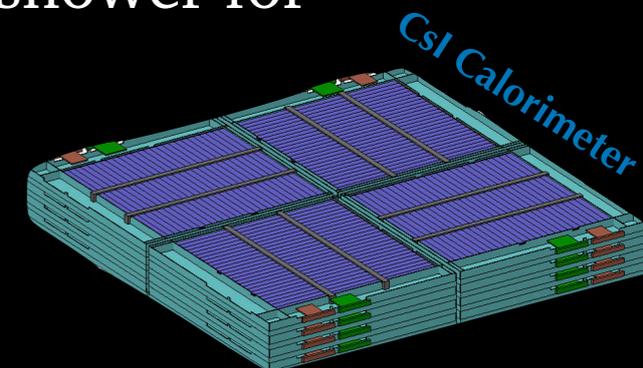
- 60 layer DSSD, spaced 1 cm
- Strip pitch 0.5mm



CZT Calorimeter

Measures location and energy of Compton scattered photons, and head of the shower for pair events

- Array of 0.6 x 0.6 x 3 cm position sensitive CdZnTe bars



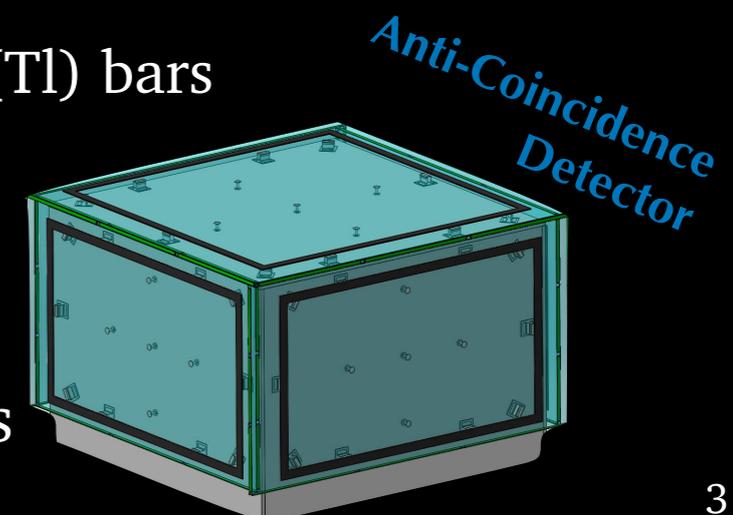
CsI Calorimeter

Extends upper energy range

- 6 planes of 1.5cm x 1.5 cm CsI(Tl) bars

Anti-Coincidence Detector

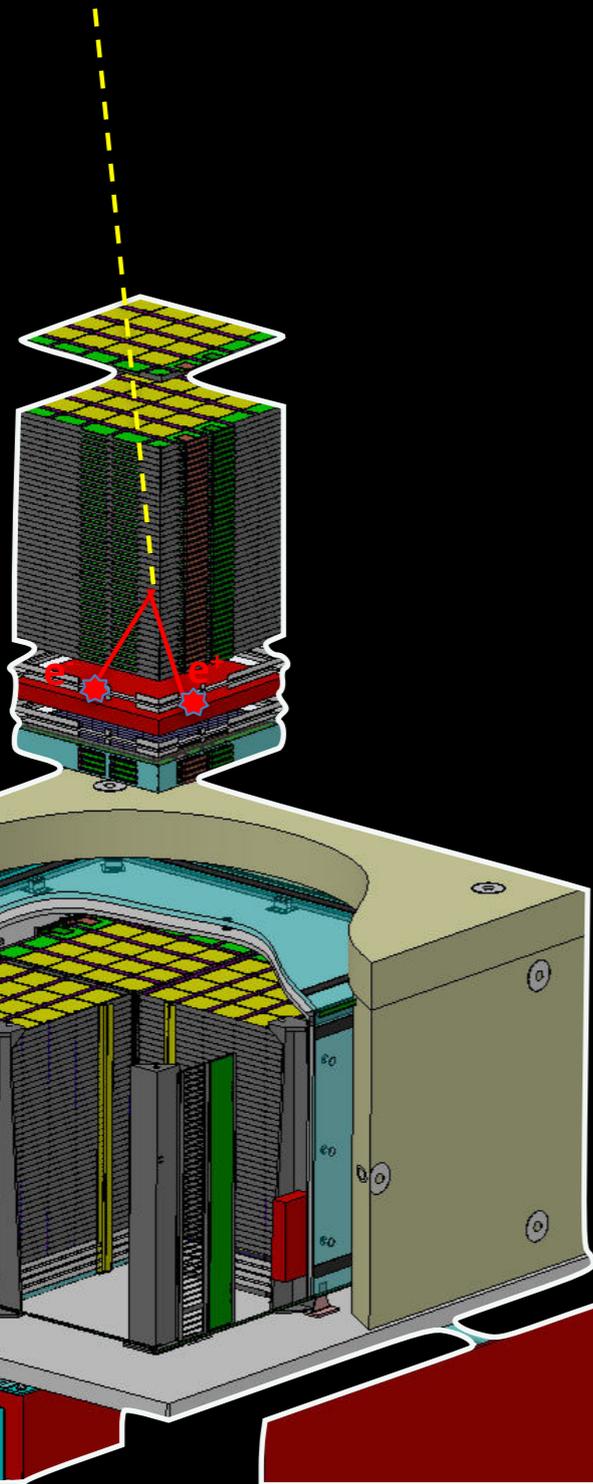
Plastic scintillator with SiPM readout vetos cosmic ray events



AMEGO – Instrument Design

IF LOIs: 100, 115, 127, 154, 170

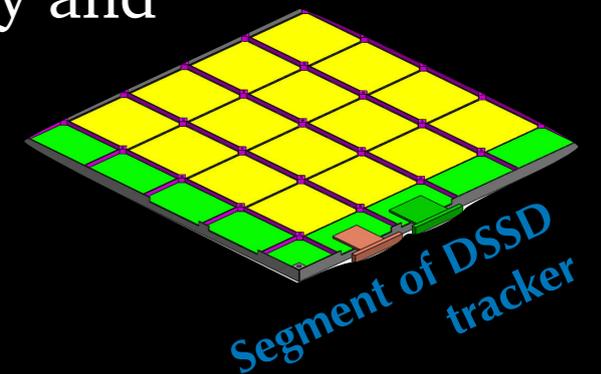
Pair telescope ≥ 10 MeV



Tracker

Incoming photon undergoes pair production or Compton scattering. Measure energy and track of electrons and positrons

- 60 layer DSSD, spaced 1 cm
- Strip pitch 0.5mm



CZT Calorimeter

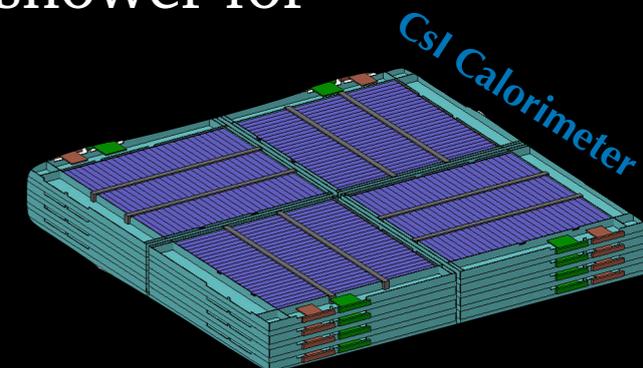
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