



Dunkle Materie

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Rotary Club Alte Brücke | 19. Juli 2021 | Schloss Heidelberg

Was ist da draussen noch?



Andromeda-Galaxie circa 1950

Vera Rubin
als Studentin



Die Sterne laufen anders als sie sollen



Jan Oort

Vera Rubin

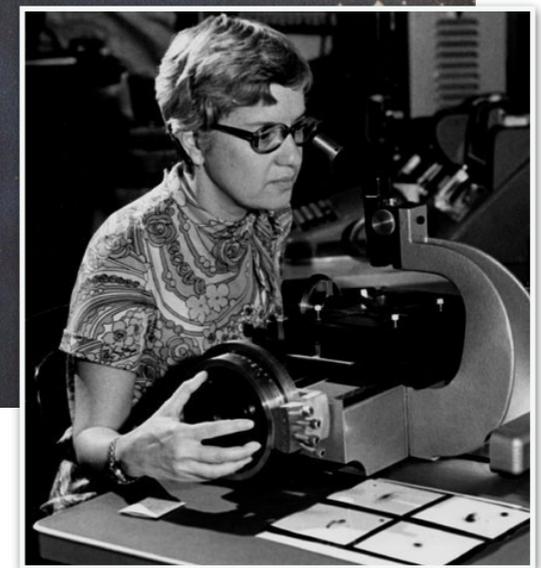


1900-1992

Fritz Zwicky

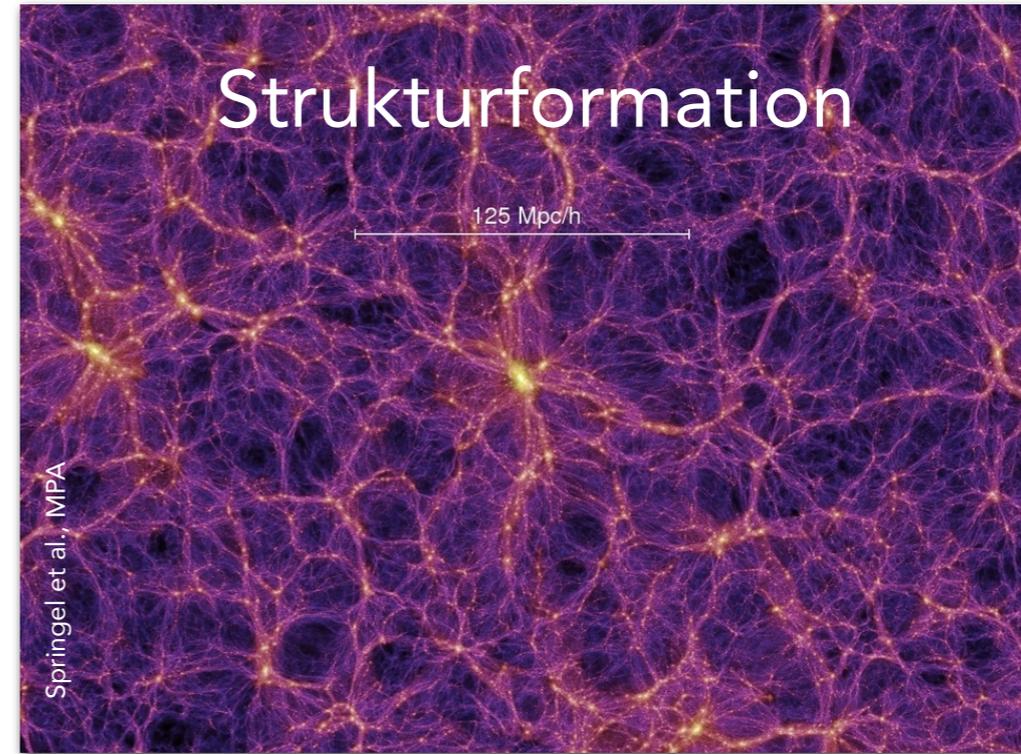
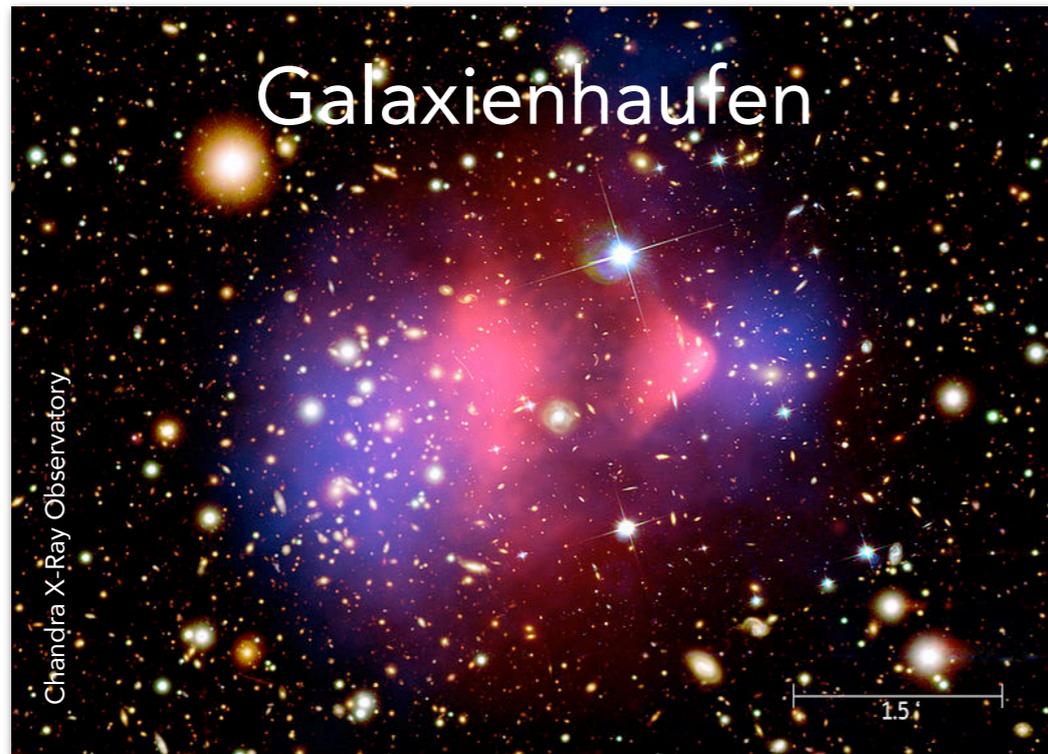


1898-1974

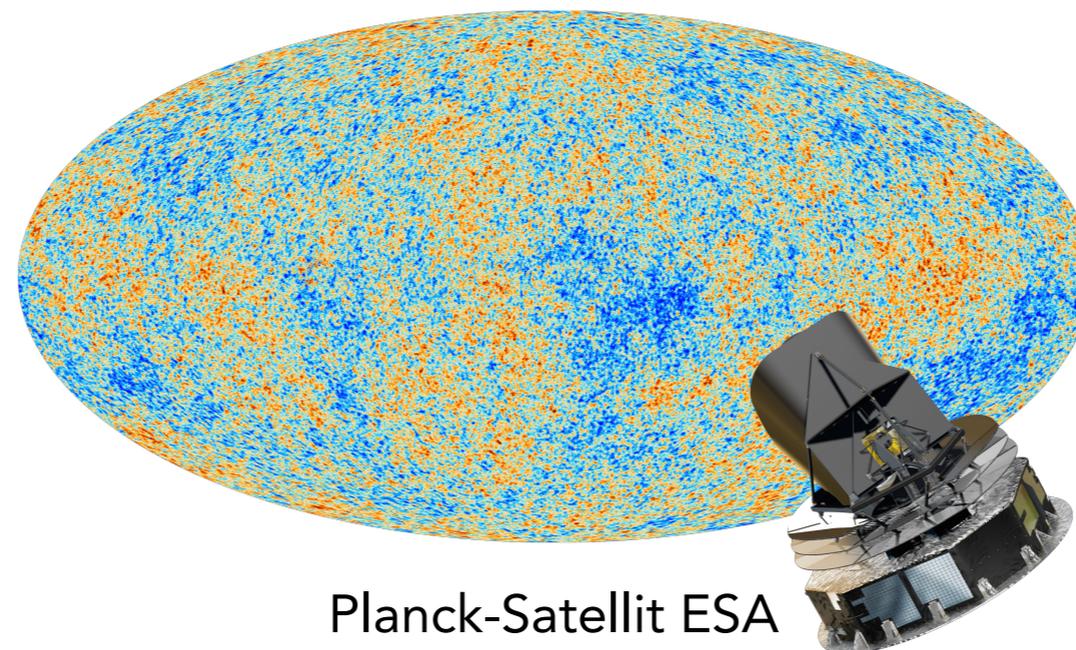


1928-2016

Es geht nicht ohne Dunkle Materie

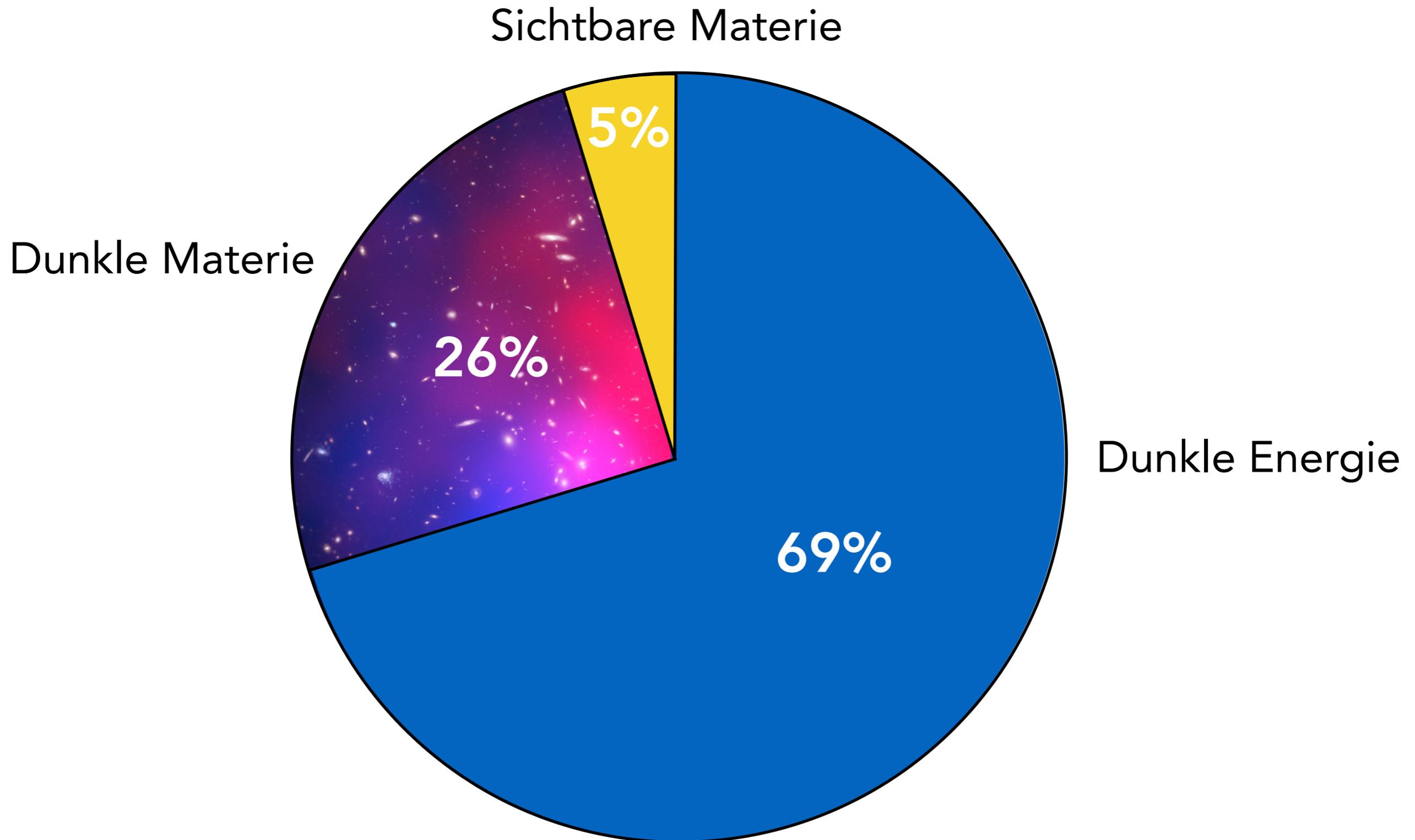


Kosmischer Mikrowellen-Hintergrund

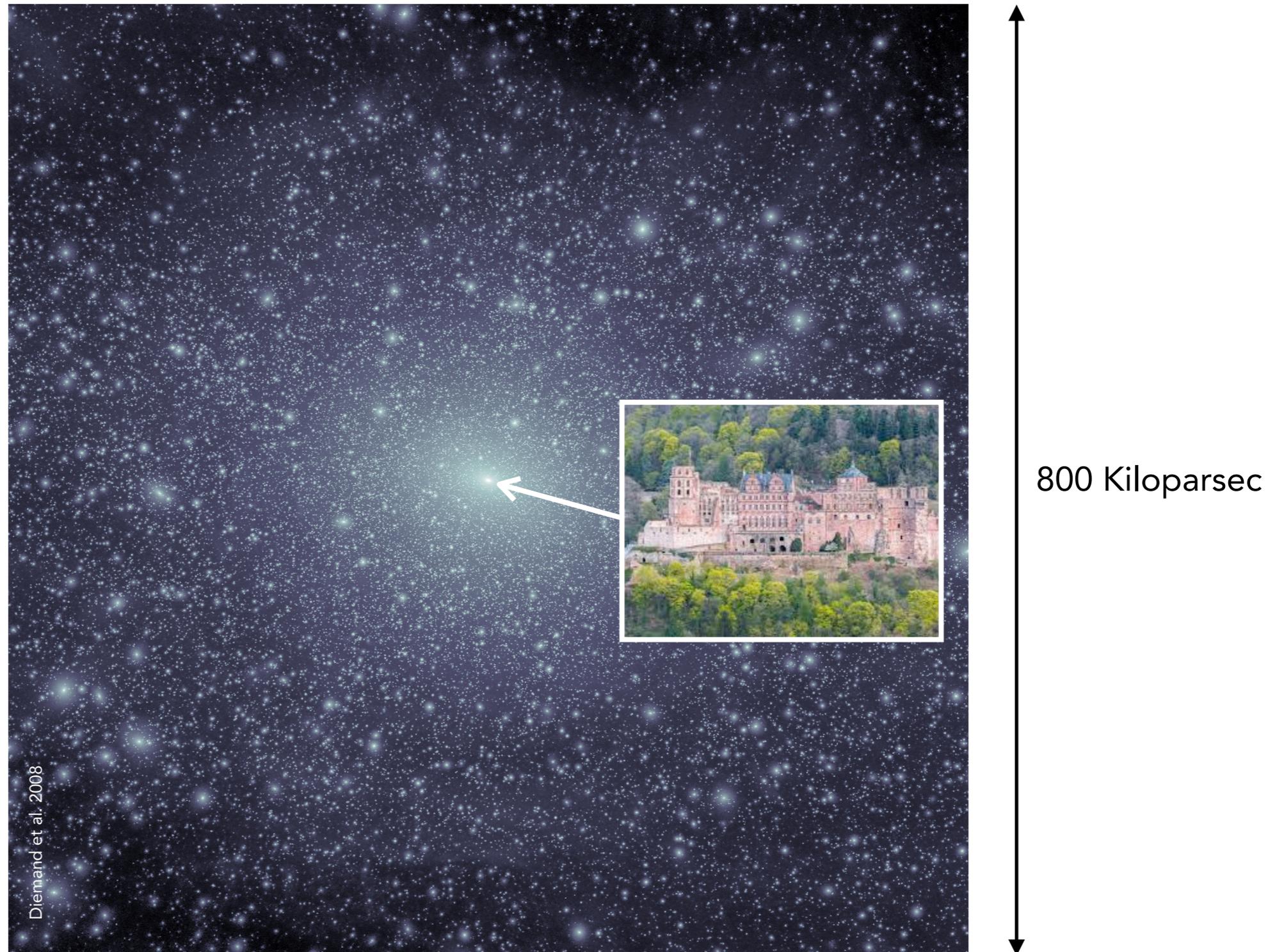


Planck-Satellit ESA

Das Energiebudget des Universums



Dunkle Materie in der Milchstrasse

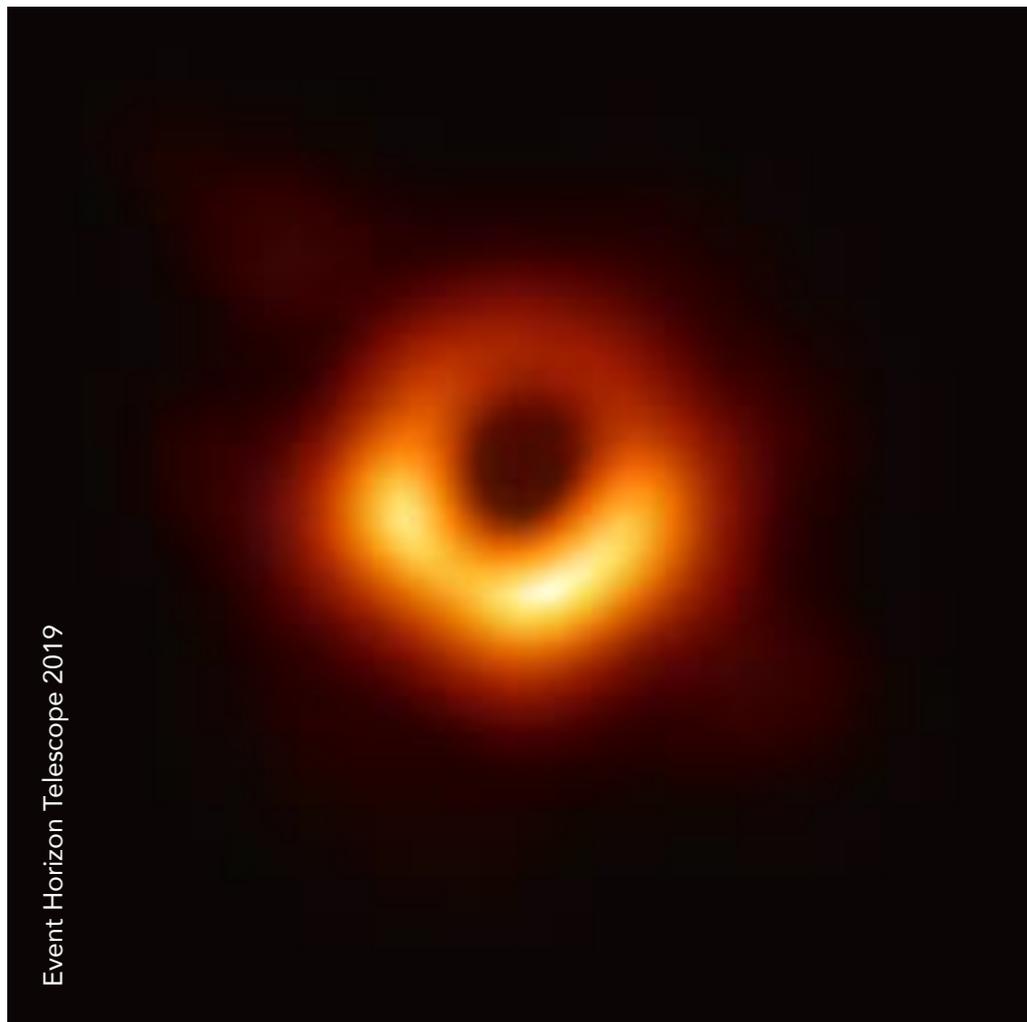


Dunkle Materie in der Milchstrasse

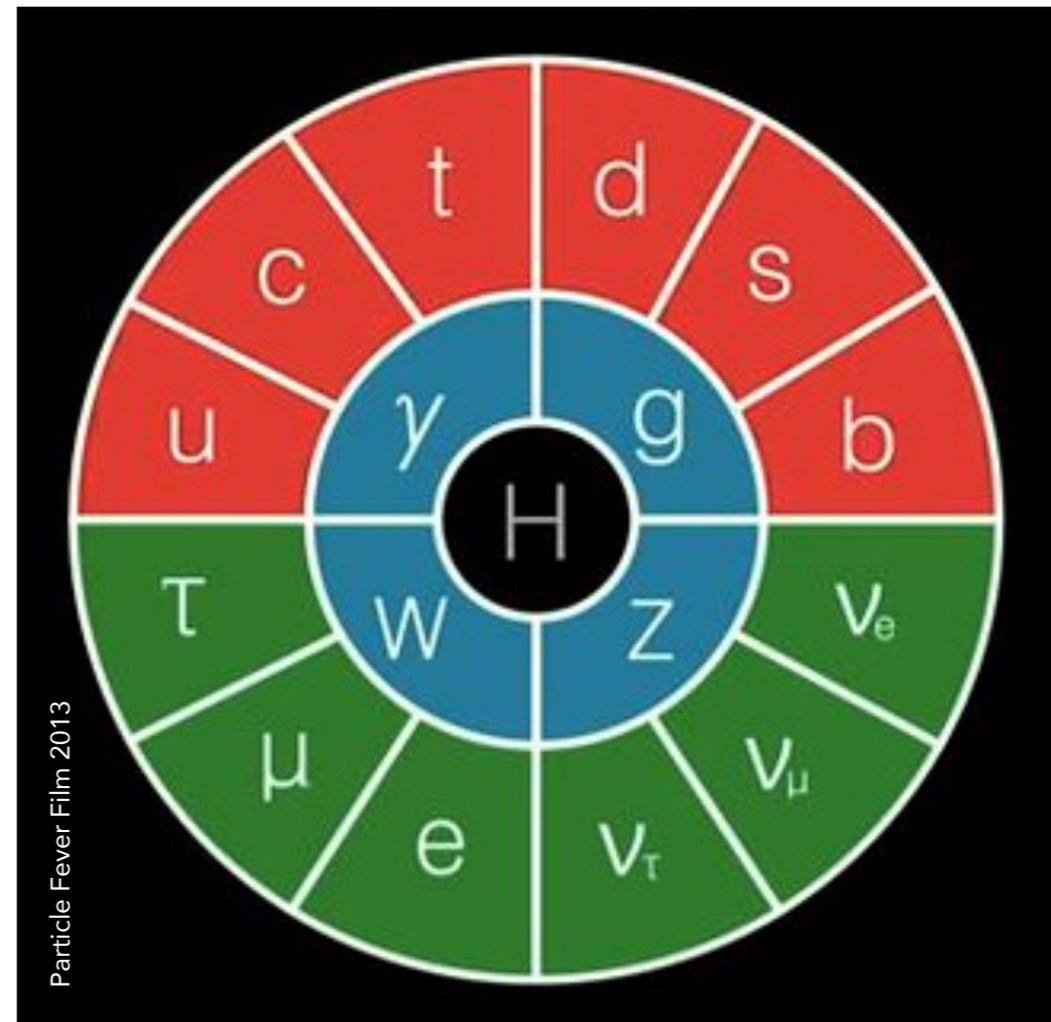


Top-Kandidaten für Dunkle Materie

Schwarze Löcher?

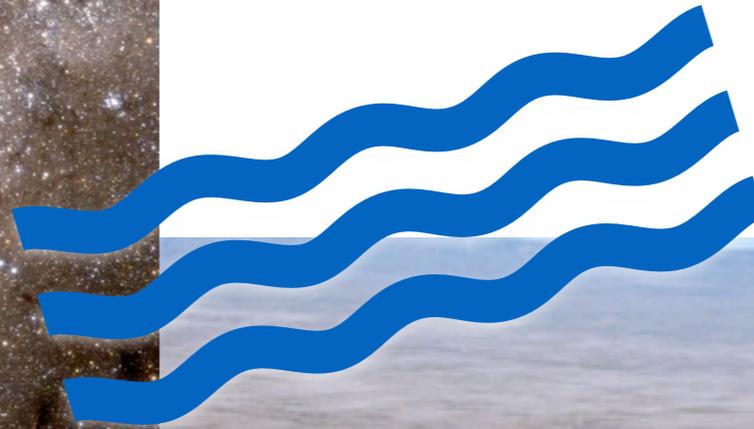


Neue Teilchen?



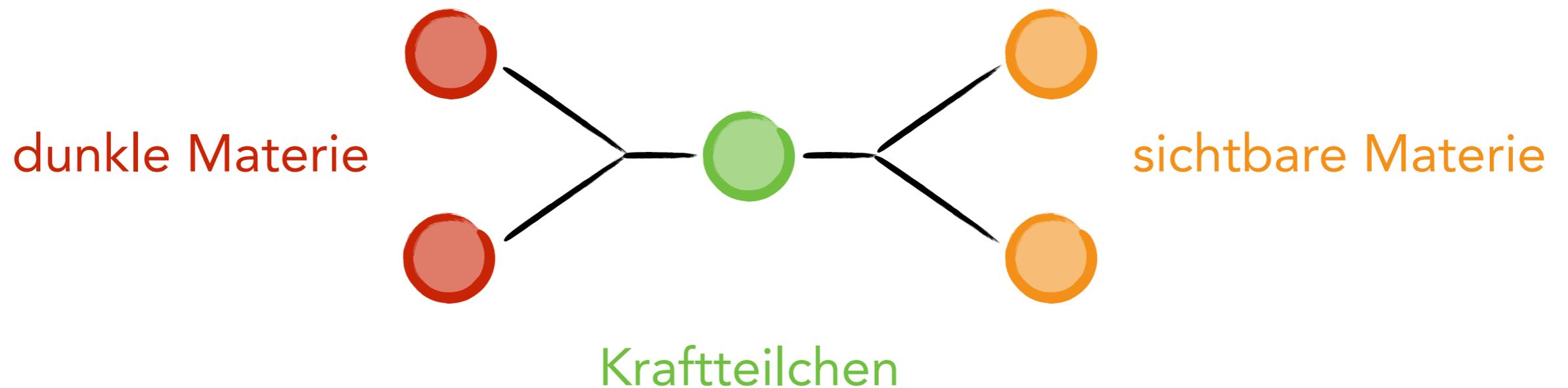
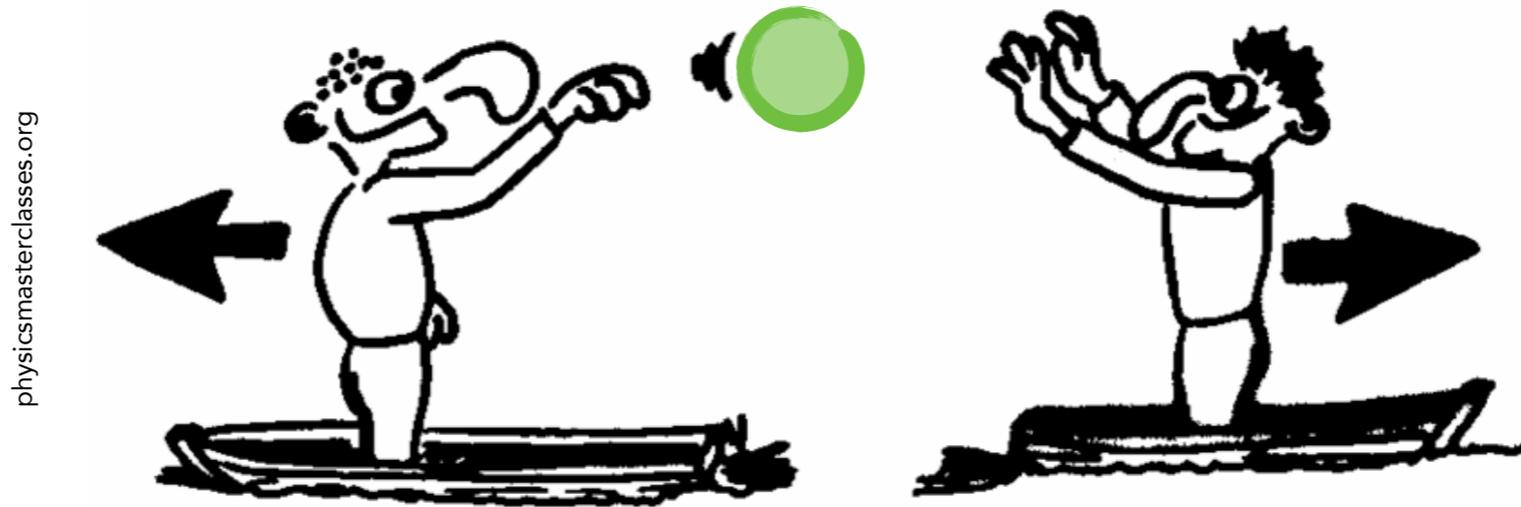
So finden wir Schwarze Löcher

Fusion erzeugt Gravitationswellen



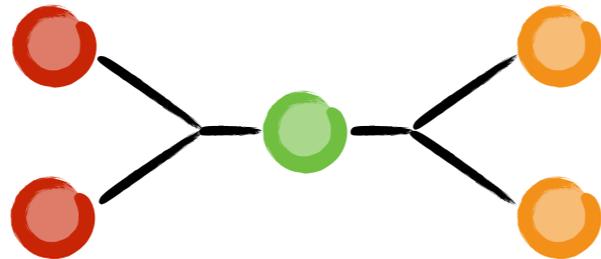
Gravitationswellen-Experiment LIGO in Hanford, WA

Teilchen üben Kraft aufeinander aus



So finden wir Dunkle Teilchen

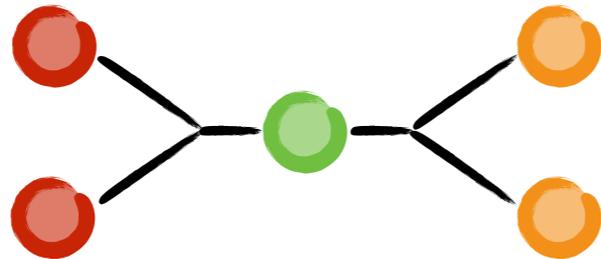
vernichten:



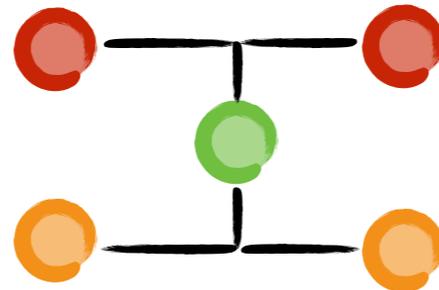
Fermi Large Area Telescope, im Orbit

So finden wir Dunkle Teilchen

vernichten:



streuen:

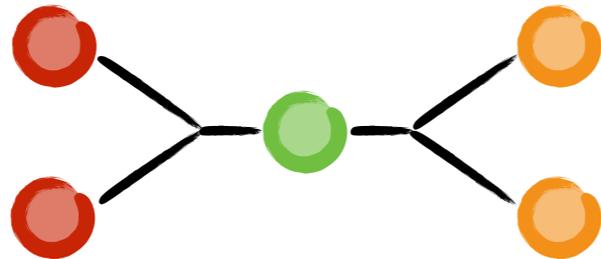


University of Chicago

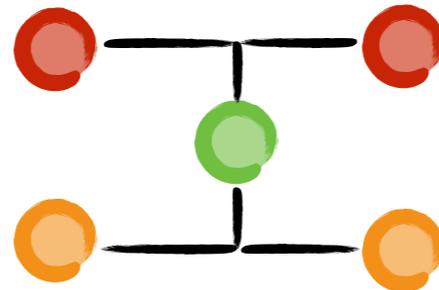
Xenon1T Experiment, Gran Sasso

So finden wir Dunkle Teilchen

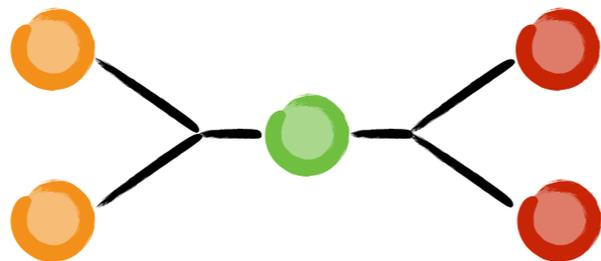
vernichten:



streuen:



produzieren:



Large Hadron Collider am CERN, Genf

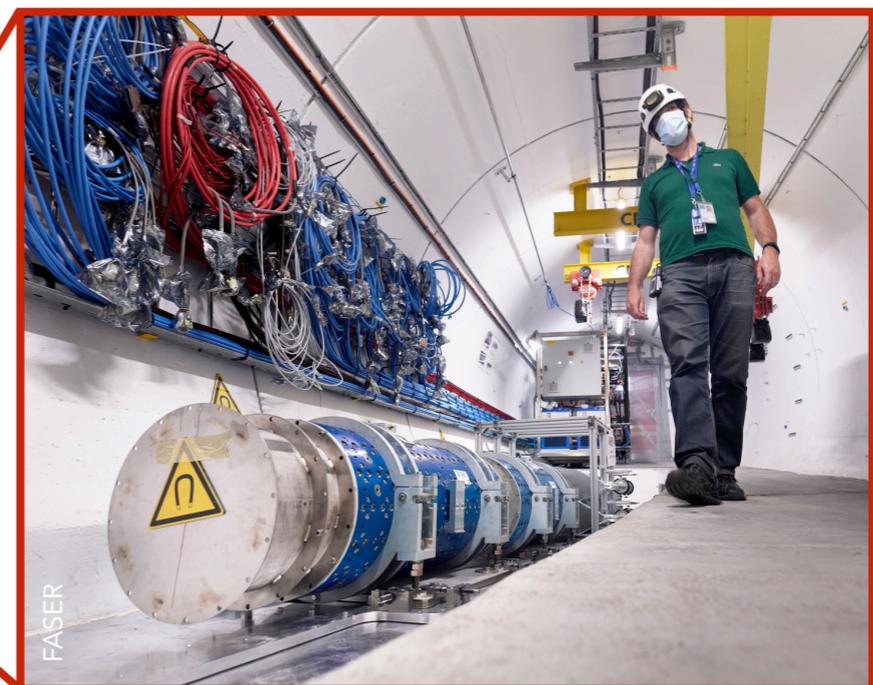
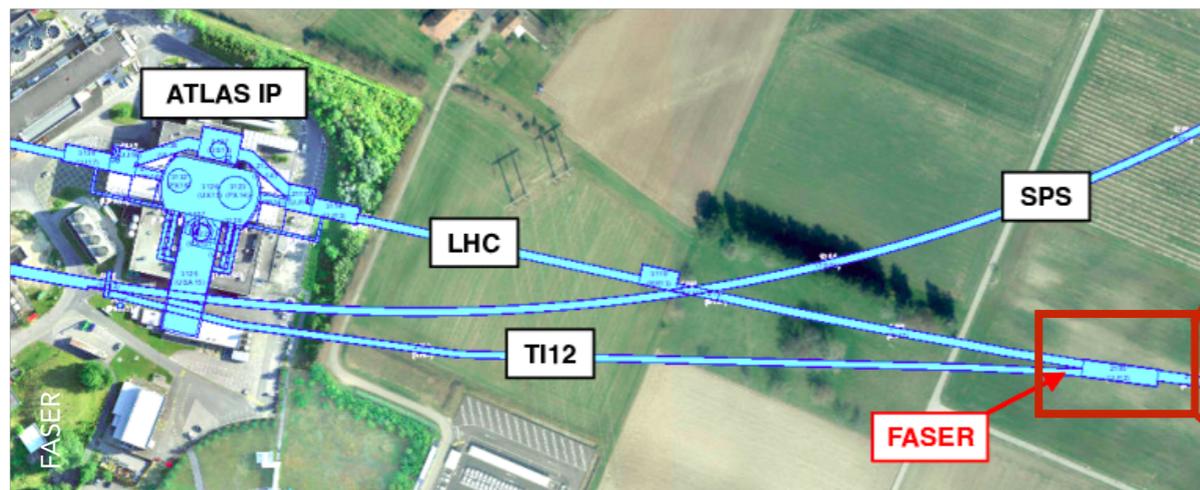


Methusalem-Teilchen

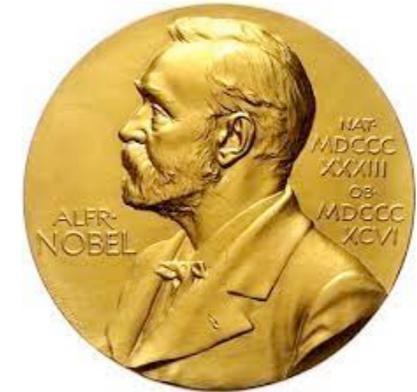
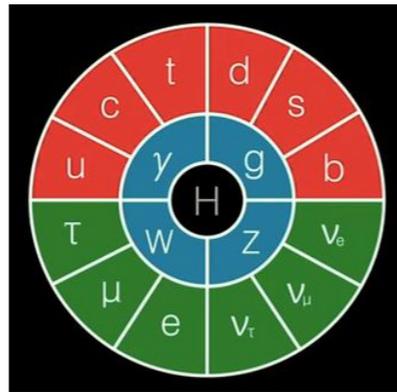
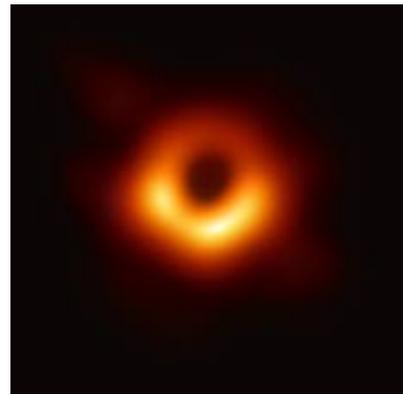
SEHR schwache Kraft — SEHR lange Lebensdauer



FASER: ein neues Experiment am CERN



Um die Dunkle Materie zu verstehen



... braucht es

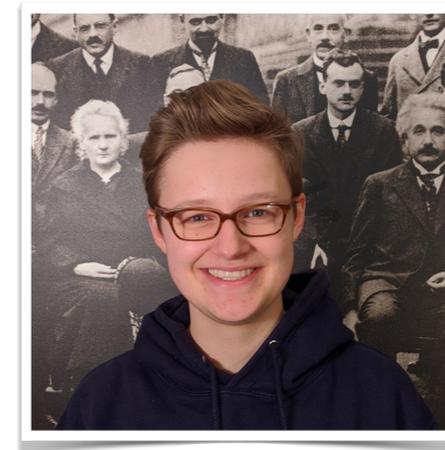
- neugierige Forscherinnen und Forscher



Sebastian Bruggisser



Ruth Schäfer



Lara Grabitz

- verlässliche Vorhersagen und präzise Experimente
- sehr viel Durchhaltevermögen.